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K. H. Condit F. H. Colvin

Editors

Shop Equipment Review

Machinery, tools, general plant equipment, materials, parts and mechanisms described in the Shop Equipment News department of the American edition for the first six months of 1932 are reviewed

In another section are condensed descriptions of similar items that appeared in the Engineering Workshop Equipment department and in the Leipzig Fair reports of the European and Colonial edition from December, 1931 to June, 1932

NINETEENTH consecutive issue of the Semi-Annual Shop Equipment Review, the present number contains 462 condensed descriptions of domestic and foreign equipment in two sections. During the period under review business conditions have been the most adverse during the depression, but despite this the development of equipment has proceeded at a normal rate. Because this level of design activity has prevailed since equipment sales started to taper off in 1930, by the time a resumption in trade takes place plant machinery now installed will be found to be considerably more obsolete than when the depression set in.

What designers of metal-cutting machines have been striving for is flexibility, ease of operation, and ability to use the newer cutting materials to capacity. The last, in particular, has required designing for much greater power, rigidity, and a much extended range of speeds and feeds. To achieve these ends, attention has been devoted to application of hydraulic feeds and holding devices, the newer materials, higher powered motors, improved gears and clutches, improved electrical controls and centralized controls.

Research on the cemented carbides is still being pushed rapidly by both the manufacturers and the machine builders. In an effort to learn what the materials will really do, one manufacturer has caused the development of huge lathes for determining the maximum capacity. One such lathe has spindle speeds to 1,200 r.p.m. and is powered by a 100-hp. motor. Carriage feeds are in 100 steps from 1¼ to 43½ in. per min. A chip conveyor is necessary since the metal removed per minute runs into many pounds. If considerable money is being devoted to research by tool suppliers on the one hand, considerable time and effort are being expended by the machine builders on the other hand. Several lathes have been developed for use of carbide tools and others have been made heavier and provided with more power. Milling machines also have yielded to the necessity for greater production and flexibility. Spindle speeds have been increased in range to make use of the largest and smallest cutters, and the feeds have likewise been extended. Tool and cutter manufacturers are keeping up with the procession, offering milling cutters, toolbits, and toolholders.

The vogue for hydraulic operation of machine tools continues unabated. Twenty-two American and eleven European machines make use of the hydraulic principle for feeds, rapid traverses, chucking, and cushioning of reciprocating movements or indexing. Many of these applications are to equipment using carbide tools. They permit more power to be applied, with smoothness, and are more easily controlled. In some cases, a single valve takes care of all machine movements. American equipment including hydraulic features covers a wide field as follows: A connecting-rod boring machine, two upright drills, a gear finishing machine, a universal grinder, one vertical and one horizontal grinder of the internal

type, a connecting-rod grinder, a honing machine, a production milling machine, a keyway milling machine, horning press, platen press, bench press, a dial tapping machine, an automatic machine for Brinelling forgings, one vertical broaching machine, a die-casting machine, a hammering (swaging-type) machine, and a machine intended for reclaiming hacksaw blades. Although the number of European machines using hydraulic features is not so great, they are noteworthy and show some interesting variations from American practice. They comprise: Two face grinders, a surface grinder, a machine-bed grinder, crankshaft and crankpin grinders, a honing machine, a "flowing chip" lathe, a piston lathe, a vertical milling machine, a duplex miller, and one saw.

In all such machines the greater power employed and the necessity for trouble-free operation has compelled much experimentation and raising of the standards for materials and parts entering into the design. Cast structures are increasingly being made of the higher strength irons, semi-steels or steel castings, and are better ribbed and sectioned to resist vibration and deflection. Ways on some machines are of nitrided steel and are furnished with force-feed lubrication. Gears are of heat-treated steel and ground. Shafts and reciprocating parts are made of special steels. Anti-friction bearings are extensively employed in almost every machine met with, and many makers claim that their products are anti-friction equipped throughout.

Built-In Lubrication

A few years ago the lubricating devices used on metal-working machinery would have been considered accessories and would have been given little thought. But the expensive high-speed machinery produced today depends for successful operation to a great extent on the proper selection of the lubricant, the lubricating device or devices, the oil filters and the design of the reservoir. In some designs the oil reservoir supplies both the lubricating and the hydraulic system. Whether it does so or not, the reservoir must be large enough to free the oil of trapped air and heat. Some machines are inoperative until the bearings have been lubricated, and in others the oil-pump motor is interlocked with the main control board so that the machine cannot function if the oil supply fails.

Motor-driven machines have been offered almost exclusively by American builders for some time, and European makers are now following this trend to a greater extent. It is now the practice in some quarters to build the motor directly onto the spindle in order to deliver more power at the point of application. Where motors are not directly connected, flat belts, V-belts and chains compete as the transmission medium, and some motors are mounted on adjustable brackets or pivoting baseplates. Sometimes each function or movement of a machine is driven by its own motor, so that some production units may have as many as five or six motors of assorted sizes.

Extremes in Size and Performance

On glancing through the pages of the American section, one finds many outstanding achievements. Largest of its type in this country is a horizontal boring and facing machine that will bore and face at one setting the cylinders and guides of booster pump units. The largest cylinder faced is 96 in. and the length of work accommodated is 22 ft. A small jig boring machine is suitable for clock work. Radial drilling machines feature such improvements as direct drive from induction motor, spindle speeds to 1,800 r.p.m., and as many as twelve spindle speeds. Drillheads permit changing spindle locations for various jobs.

Gears from 22 ft. in diameter to pinions 3 in. in diameter are cut on one large generator, and another has cut the time of roughing in half by utilizing higher speeds and feeds and by better chucking means. The recent call for hourglass steering worms has been met by a thread generator. Any helix angle, right or left, can be finished by the same cutting rack on one gear finishing machine.

Small diameter work is subjected to a high horsepower grinding-wheel load to increase production in a saddle-type grinder. Field faces of large motors or continuous bores are ground on a large vertical internal grinder that will grind internally, externally and on the face at the same setting. For advanced automotive practice there is a connecting-rod grinder that grinds the relief side of the inside diameter of the large end.

Besides the large 100-hp. lathe mentioned, there are five lathes offered for tungsten carbide. Production types have a top speed of 2,000 r.p.m.; engine lathes, 3,600 r.p.m. Six milling machines are also suitable for carbide tools. Knee-types have spindle speeds to 1,300 r.p.m.; and one vertical machine for using end mills has speeds to 1,800 r.p.m. A manufacturing type for small pieces, and also flexible enough for toolroom use, has spindle speeds to 1,800 r.p.m.

Under the heading of "Other Machines" in the American section are more than forty machines of interest to production executives. Welded steel construction is employed for one bending brake. A power adjusted dieholder on a bulldozer cuts down the time of setting up dies. Two parts at a time are burnished by an automatic surface burnishing machine. Up to 450 shots per hour is the capacity of a hydraulically operated die-casting machine. In a die-making machine, the overarm may now be swung away from the file so that the piece can be removed quickly for inspection. All types of flanging are done on a sheet-metal former. Cold stock, fed to an automatic electric header, is cut to length, heated locally and headed. Small parts loaded into an automatic plating machine are conveyed through all operations, and the time of deposit can be regulated. Round, flat, or beveled work is polished on a multi-stage machine, which is human-like but unerring in operation. A cut-off saw uses an arc, the work being one electrode. Timing devices for use in connection with resistance welders have been developed by two companies and make use of electronic tubes to give close and accurate control.

Refined Measuring

Comparators are now being made for much greater amplification of the measurement and provided with scales to suit toolroom and gage inspection or production inspection. A spectroscope permits rapid estimation of the constituents of steels. A recent trend in speed reducers is to mount the speed reduction gears within a motor housing to form a compact motorized unit.

Welding rods and electrodes are offered in bronze, aluminum, stainless steel and other materials, and come in coils as well. Free-machining 18-8 and a stainless steel that does not work-harden to the usual extent are offered. Lubricators, pumps, flexible seamless tubing, air and hydraulic valves are mentioned. Dissociators for anhydrous ammonia offer a convenient and cheap means of obtaining nitrogen.

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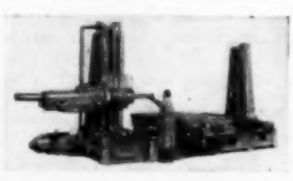
Boring and Turning Machines

Boring, Drilling and Milling Machine, Horizontal

Lucas Machine Tool Co., E. 99th St., & N.Y.C.R.R., Cleveland, Ohio. [Vol.76,p.598.]

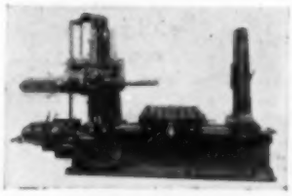
Increased cross adjustment and vertical capacity for certain classes of work are provided. General specifications of the standard No. 53 machine are: diameter of spindle, 5 in.; Morse taper hole in spindle, No. 7; traverse of spindle, 72 in. (2x36 in.); maximum distance faceplate to outer support, 8 ft.; maximum distance, top of table to center of spindle, 60 in.; distance, top of bed to top of table, 15⅜ in.; size of table, 48x96 in.; cross-feed to table, with automatic trip, 84 in.; speed changes (18) 7½ to 220 r.p.m.; number of feed changes (9 for each position of spindle back-gears), 18; feeds 0.004 to 0.750 in.; rapid traverse, 97 in. per min.; shipping weight, about 50,000 lb.



Drive for Horizontal Boring Machine

Lucas Machine Tool Co., E. 99th St. & N.Y.C.R.R., Cleveland, Ohio. [Vol.76,p.625.]

Through this auxiliary high-speed drive to the main spindle, final drive at the high-speed range is by means of multiple V-belts. This unit adds six spindle speeds to the small-size No. 41 and seven speeds to the larger size machines, over and above the regular range of 18 geared speeds. Range of the 3-in. spindle No. 41 is 13½ to 1,200 r.p.m., of the 4-in. spindle No. 42, 9 to 1,000 r.p.m., and of the 5-in. spindle No. 43 and No. 53, 7½ to 860 r.p.m.



Boring and Facing Machine, Horizontal, Cylinder

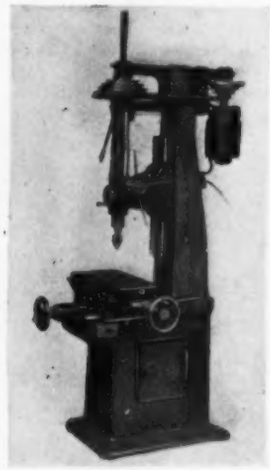
William Sellers & Co., 1600 Hamilton St., Philadelphia, Pa. [Vol.76,p.709.] 239.

Largest of its type in the country, this machine will bore and face, at one setting, the cylinders and guides of large engine and booster pump units. The largest cylinder that can be faced is 96 in. in diameter, and the maximum length of work accommodated is 22 ft. Work table is 23 ft. long by 8 ft. wide, with the center of the boring bar 54 in. above it. Total length of the bed is 48 ft. 8 in. The boring bar is supported by two heads, one stationary and serving as a driving unit, the other, the tailstock, adjustable longitudinally. The 12-in. bar, driven by a 40-hp. motor, is 43 ft. 8 in. long.

Boring Machine, Jig

Moore Special Tool Co., Inc., Bridgeport, Conn. [Vol.76,p. 382.] 134.

Drilling and boring holes in tools, dies, jigs or fixtures comprises the field of this jig boring machine. Specifications: longitudinal movement, 14¼ in.; cross-movement, 9¼ in.; floor

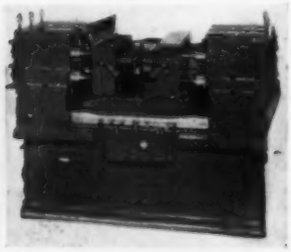


space, 24x36 in.; vertical travel of quill, 3⅜ in.; maximum distance from spindle to table, 15 in.; maximum hole size, 1½ in. in tool steel; speeds 200 to 2,000 r.p.m., and weight, 1,150 lb.

Boring Machine, Connecting-Rod, Precision, Model 216A

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman Blvd., Detroit, Mich. [Vol.76,p.744.] 293.

Model 216A, replacing Model 216, embodies several improvements. A pedestal foot-type base has been adopted so that chips, dirt or water cannot collect. Over-all height has been

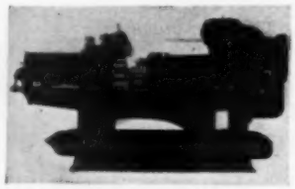


reduced for easier loading of the fixture. The table has a V and flat way, each of which are provided with forced-feed lubrication. A hydraulic brake unit stops the boring tool. Six boring units are used on each end of the machine.

Chucking Machines, Six-Spindle

Cleveland Automatic Machine Co., 2269 Ashland Road, Cleveland, Ohio. [Vol.76,p.147.] 55.

The bar machine is made in ⅞-, 1¼- and 1½-in. sizes, and the chucking machine in 4¾- and 6½-in. sizes. Spindle and tool-turret housings are cast integral with the main bed castings of nickel alloy. Threading and reaming spindles are accelerated and operate independently of the tool feed. Two independent cross-slides are provided, one each for the lower front and rear stations. A choice may be had of air, hydraulic or mechanical chucking, full automatic or hand-controlled. Helical change gears are provided.



Drilling Machines

Drilling Machine, Upright, No. 112

Defiance Machine Works, Defiance, Ohio. [Vol. 76,p. 153.] 45.

By transposition of gears any one of 16 speeds from 263-1,234 r.p.m., or 16 feeds from 0.004 to 0.025 is available in this machine. Multiple-disk driving clutches, which give forward

and reverse when tapping, are mounted on the main drive shaft. Specifications: Capacity in steel, ⅜ to 1½ in.; center of spindle to column face, 10½ in.; spindle travel, 13 in.; maximum distance spindle nose to top of table, 32½ in.

Drilling Machine, Upright, Hydraulic-Feed

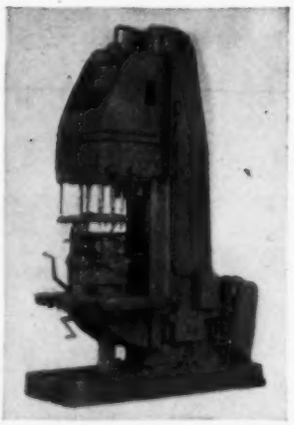
B. M. Root Co., York, Pa. [Vol.76,p.221.] 47.

Although developed principally for the woodworking industry, the Style "CH" machine has a flexible hydraulic feed that makes it suitable for drilling and tapping small holes in panels. It is built in four lengths, 3, 4, 5 and 6 ft., with front-to-back spindle adjustment of 12 in. The hydraulic feed provides automatic continuous or intermittent strokes. Spindle speeds are 1,800 r.p.m. The 3-ft. machine will accommodate 11 spindles; the 6-ft. machine, 22 spindles.

Drilling Machine, Multiple-Spindle, Hydraulic

National Automatic Tool Co., Richmond, Ind. [Vol.76,p.63.]

Especially designed for fixed-center multiple drilling, the Natco Model B-14-H hydraulic drilling machine is so arranged that various cluster boxes are

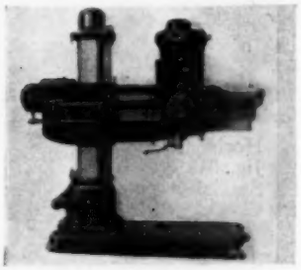


easily changed to suit each individual job. The table is of the adjustable knee type. Minimum height of the working surface above the floor line is 22 in.; total adjustment, 17¼ in.; area of the working surface is 23 by 40 in.

Drilling Machines, Radial

American Tool Works, Cincinnati, Ohio. [Vol.76,p.185.]

Ball and roller bearings are used throughout. All shafts, including the spindle, are of alloy steel, heat-treated, ground and multiple splined. The improved elevating mechanism is controlled from the head and is accident proof. Operating levers

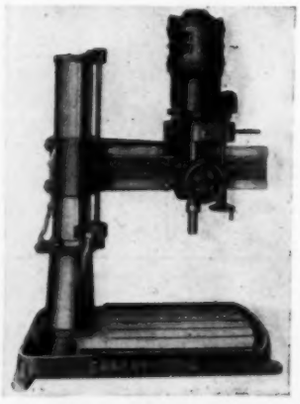


have been centralized. The improved tapping attachment makes use of a combined spring steel and fiber friction band contacting with the hardened and ground surface of the friction cup.

Drilling Machine, Radial, 8-Speed

Canedy-Otto Mfg. Co., Chicago Heights, Ill. [Vol.76,p. 685.] 254.

Direct drive at high speed from a 4-speed induction motor mounted on the head, is one of the features of the improved "C-O" 3- and 4-ft. radial drills.



Four additional speeds are provided through a back gear with single-lever control. Four feeds are available through an alloy steel heat-treated gear train.

Drilling Machines, Radial, 3- and 4-Ft.

Canedy-Otto Mfg. Co., Chicago Heights, Ill.. [Vol.76,p. 715.] 253.

This machine has twelve spindle speeds from 28 to 1,800 r.p.m. with an 1,800-r.p.m. motor. Push-button control with reversing station is standard. Six feeds are provided through an alloy steel, heat-treated gear train. Two sets of Timken roller bearings support the spindle. All other rotating parts are also mounted on anti-friction bearings. The machine

is similar in general construction to that described in the previous item.

Drilling Machine, 5-Way

Foote-Burt Co., Cleveland, Ohio. [Vol.76,p.745.] 286.

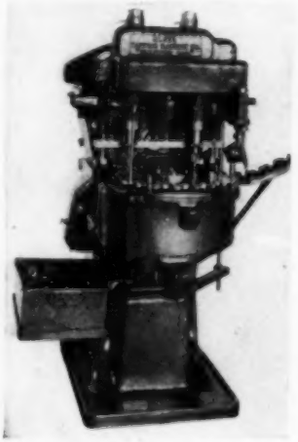
Having a total of 90 spindles, this special 5-way multiple spindle drilling machine is for drilling a V-type cylinder block. It has one vertical head, two upper

angular heads and two lower angular heads and is of unit-type construction. Heads are driven by the drum-type cam units. One throw-in lever operates all drilling units.

Drilling and Countersinking Machine, Dial, Automatic

Globe Tapping Machine Co., 751 Central Ave., Bridgeport, Conn. [Vol.76,p.746.] 296.

By having two ball-bearing spindles, one for roughing and one for finishing, the parts are finished free from chatter



marks. If the dial should fail to index properly, the automatic mechanical trip will prevent the head from coming down.

Drillhead, Multiple-Spindle

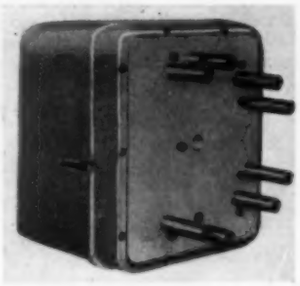
Miami Engineering Co., Fourth & Wells St., Milwaukee, Wis. [Vol.76,p.217.]

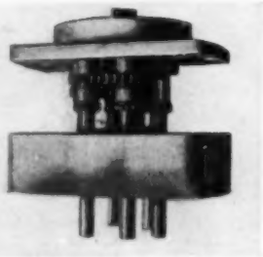
This adjustable fixed-center head employs a new principle in gear arrangement to give positive drive, but permits changing spindle locations for various drilling jobs. Minimum spindle center distance is the diameter of spindle plus $\frac{1}{16}$ in. Spindle speeds can be changed from one set-up to another without altering the gearbox.

Drillheads, Multiple-Spindle

A. H. Pearson, 7 East Grand Ave., Detroit, Mich. [Vol.76, p.657.] 250.

Replacement of the usual gear train by sprokets and a driving chain feature "Ace" multiple-spindle drill heads. The head is claimed to drive six $\frac{23}{32}$-in. drills at 1,200 r.p.m. with a chain speed of 700 r.p.m. Number of steps of the driving and driven head is limited by the height of the head. A chain take-up device is provided.



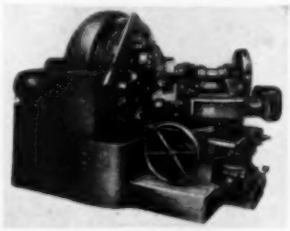


Gear-Cutting and Allied Machines

Gear Generating Machine, Spiral-Bevel

Gleason Works, 1000 University Ave., Rochester, N. Y. [Vol.76,p.535.] 204.

The No. 16 spiral bevel gear generator replaces the 15-in. generator. Among the features are an improved type of cutter



cradle, new reversing and indexing mechanisms, straight-line movement of the work into the cutter, and more liberal use of anti-friction bearings.

Gear Generating Machine, Farrel-Sykes

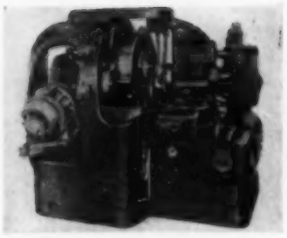
Farrel-Birmingham Co., Ansonia, Conn. [Vol.76,p.681.]

Gears 22 ft. in diameter, 60 in. in face width and with 6-in. circular pitch or $\frac{1}{2}$ diametral pitch, weighing up to 50 tons, may be handled in this 120-ton Farrel-Sykes gear generator. It is primarily adapted for cutting herringbone gears used in the steel industry or turbine reduction gears. It will also cut pinions as small as 3 in. The work carrying mechanism is rigidly secured to the bed, and the cutter driving and controlling mechanism is mounted on a saddle, because the work is frequently much heavier than the cutter driving and controlling mechanism. Length of stroke, 0 to 32 in.

Gear Roughing Machine, Spiral-Bevel

Gleason Works, 1000 University Ave., Rochester, N. Y. [Vol.76,p.184.] 39.

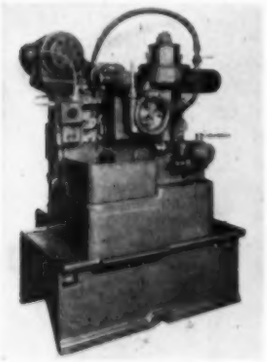
Capacity for gears up to $5\frac{1}{2}$-in. cone distance, 8 to 1 ratio, 11-in. pitch diameter and 3 D.P., is embodied in the No. 10 spiral bevel gear rougher. Gears can be rough cut in less than half the time formerly required by the use of higher feeds and speeds and by reducing the chucking and unloading time. No generating motion is employed, the tooth slots being cut by a simple depth feed motion.



Thread Generating Machine, Hourglass-Worm

Fellows Gear Shaper Co., Springfield, Vt. [Vol.76,p.152.]

A single-thread hourglass worm of 4,268 in. D.P. can be completed in 2 min. or less, floor-to-floor. The work always rotates in a clockwise direction, but provision is made through

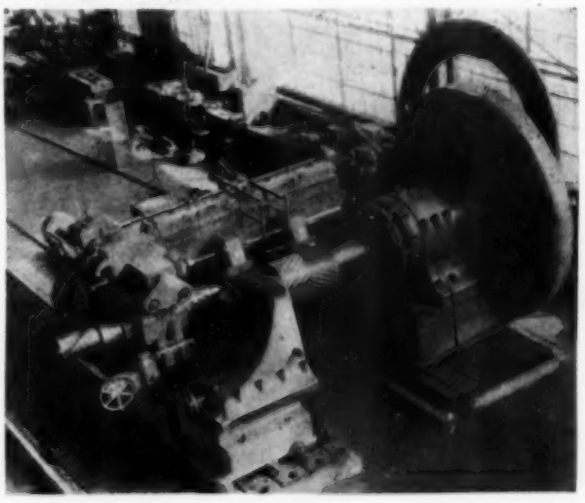


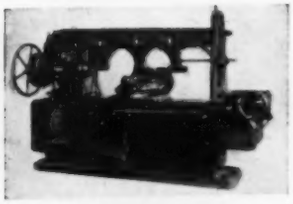
a sliding sleeve and spiral bevel gears to change the direction of rotation of the cutter for cutting right- and left-hand threads. Power is supplied by a 3-hp., constant-speed motor.

Hobbing Machine, Spline-Shaft

Barber-Colman Co., Rockford, Ill. [Vol.76,p.628.] 223.

Lengthening the bed of the standard Type A machine produced this machine suitable for





cutting long spline shafts. The work spindle has a collet-type nose with a large handwheel for clamping the work in the collet. Two work supports are mounted on the overhanging arm, consisting of half sleeves in which the work revolves and which are intended to prevent long shafts from springing out of line during the cut. Eight speeds are available.

Burnishing Machine, Pinion, Spiral-Bevel, No. 18

Gleason Works, 1000 University Ave., Rochester, N. Y. [Vol.76,p.154.] 46.

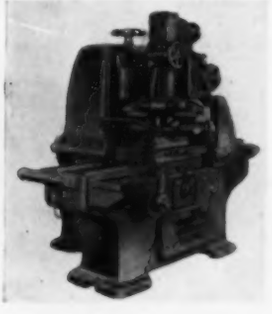
This No. 18 spiral bevel pinion burnishing machine is similar in construction to the 18-in.

combination testing and lapping machine (*AM*—Vol.69,p.703). A slight adjustment is provided to permit concentrating the burnishing operation on either the toe or heel if it is desired to change the location of the tooth bearing.

Gear Finishing Machine

Michigan Tool Co., 7171 Six Mile Rd., Detroit, Mich. [Vol. 76,p.410.] 135.

Both helical and spur gears can be finished on this hydraulic machine. Any helix angle, right or left, can be finished on the same cutting rack, providing the pitch and pressure angle are the same. The machine is so constructed that the head can be set either right or left to a 55-deg. helix angle. Limits on gears finished are 0.0015 in. eccentricity, 0.0002 in. on the involute, 0.0002 per in. on the helix angle, and 0.0002 in. on tooth spacing, while an 85 per cent contact of the full tooth form is obtained.



Rounding Machine, Bevel-Gear

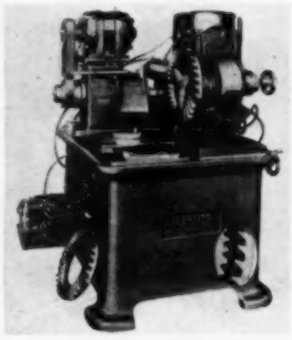
City Machine & Tool Works, 1517 E. Third St., Dayton, Ohio. [Vol.76,p.413.] 147.

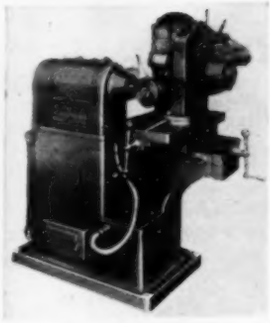
This "Peerless" machine replaces the knife-like edge of the acute angle with a smooth rounded shape that eliminates difficulties in hardening and assures satisfactory operation. The machine is completely motor-driven and has capacity for gears up to 18 in. O.D.

Workhead Drive for Chamfering Machine

City Machine & Tool Works, 1517 E. Third St., Dayton, Ohio. [Vol.76,p.221.] 61.

An optional feature at slight additional cost, this workhead drive for the Model 3 "Peerless" chamfering machine separates reduction unit and motor, and permits use of a standard motor to drive the reduction unit by means of V-belts, and enables changing operating speed of the workhead.





Grinding Machines

Grinder, Universal, Hydraulic, 10x24-In.

Landis Tool Co., Waynesboro, Pa. [Vol.76,p.148.] 43.

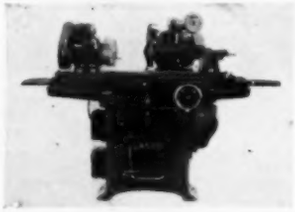
For a variety of light production jobs and for toolroom work as well, a 10x24-in. hydraulic universal grinder has been developed. Table speeds

range from 6 to 144 in. per min. Six work speeds are available by changing the pulleys and belts. The spindle may be either live or dead and is designed to receive chucks, faceplates and such equipment.

Grinder, Universal, 10x24-In.

Landis Tool Co., Waynesboro, Pa. [Vol.76,p.625.] 240.

Design for grinding a variety of light parts manufactured in small lots, this 10x24-in. motor-driven universal grinding machine has the traverse drive motor mounted within the bed, the work drive motor on the



headstock, and the wheel drive motor on the wheelbase. All controls are grouped. Three traversing speeds and six work speeds are available.

Grinder, Cylindrical, Saddle-Type

Cincinnati Grinders Incorporated, Cincinnati, Ohio. [Vol. 76,p.712.] 274.

Small diameter work, when properly supported, can be subjected to relatively high horsepower grinding-wheel load with a corresponding increase in production. Consequently, the company has introduced 6- and

10-in. saddle-type machines with greater distances between centers. Headstock incorporates spiral gearing. The 6-in. machines are built with 18 and 30 in. distance between centers; 10-in. machines, 18 and 36 in.

Grinder, Internal, No. 81

Heald Machine Co., Worcester, Mass. [Vol.76,p.567.] 199.

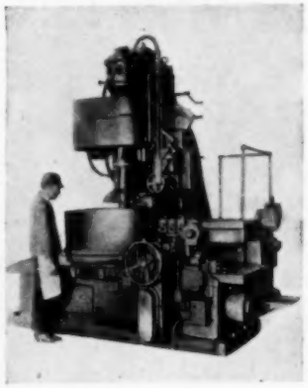
Fully automatic, this internal grinder for handling small work can be arranged to size work "Size-Matically" or "Gage-Matically." It can also be operated as a plain unit. The work-

head reciprocates with the main table instead of the wheelhead and wheel doing so. Swing over the table is 13½ in., and a 1-in. hole 2-in. long can be ground. Speeds are 900-1,650 r.p.m., and table speeds 0-40 ft. per min. Table travel is 11 in.

Grinder, Internal, Vertical

Heald Machine Co., Worcester, Mass. [Vol.76,p.798.] 312.

This machine will grind straight or taper, internally or externally, as well as face grind. The counterbalanced vertical wheelhead slide is operated hydraulically but also has hand feed. It may be furnished in

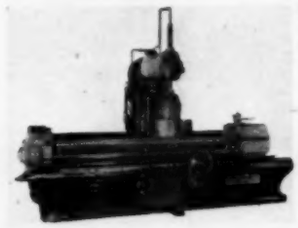


36 and 48 in. sizes. Each of these machines has five different standard heights of column, giving a clearance of 15, 18, 24 and 38 in. between the diamond and the faceplate. Also, either one of the machines may be furnished with either a 22 or 31 in. grinding stroke. A modified "Sizematic" control of size is secured. Table feed is hydraulic.

Grinder, Surface, Vertical, Hydraulic

Pratt & Whitney Co., Hartford, Conn. [Vol.76,p.183.] 53.

This 26-in. machine weighs 18 tons, and replaces the 22-in. surface grinder previously manufactured. Table working surface is 18x88 in. with a maximum travel of 104 in. Distance from the table top to the wheel

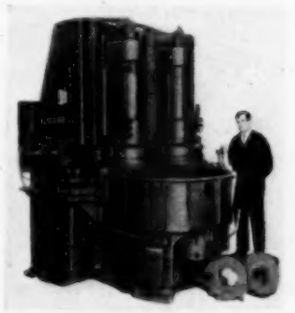


is 16 in. All controls are in front. Table speeds range from 30 to 175 ft. per min. The spindle is driven through spiral bevel gears by a 75-hp., 1,150 r.p.m., constant-speed motor, producing a spindle speed of 750 r.p.m. Power feeds range from 0.00025 in. to 0.005 in.

Grinder, Surface, Vertical, Duplex, No. 111 Series

Gardner Machine Co., Beloit, Wis. [Vol.76,p.282.] 84.

Designed to handle single-surface grinding where the work is such that it may be passed beneath two abrasive members, the No. 111 Series duplex vertical surface grinder requires one fixturing for both roughing and finishing operations. Three sizes constitute the No. 111 line, the work tables being 42, 42 and



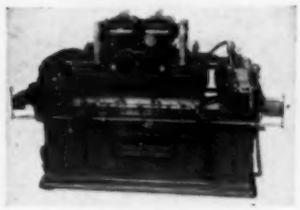
72 in. in diam. and the chuck sizes 16 in., 18 in., and 18 or 20 in., respectively.

The horizontal table is supported on flat, circular ways to eliminate spring. This construction also permits a stationary shaft through the center of the table so that fixture-operating mechanisms can be mounted.

Grinder, Connecting-Rod

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman Blvd., Detroit, Mich. [Vol.76,p.799.] 323.

For grinding the relief side of the inside diameter in the



large end of connecting rods, two banks of four internal grinding spindles are mounted on each end of the unit base, which, in turn, is mounted on the fixture table. Four motors are mounted above and between the two banks of spindles, each motor driving two grinding spindles by belts. At each end is mounted a full hydraulic fixture for mounting four rods.

Polishing Machine, Automatic

Landis Tool Co., Waynesboro, Pa. [Vol.76,p.285.] 63.

For polishing work after the finish-grinding operation, this automatic machine makes use of many elements of a standard 6x18-in. grinder. Types of work

that can be done are piston pins, valve stems and similar parts. Valve tappet production varies from 40 to 50 pieces per min. About 0.0002 in. of stock is removed.

Cutter Sharpening Machine, Helical

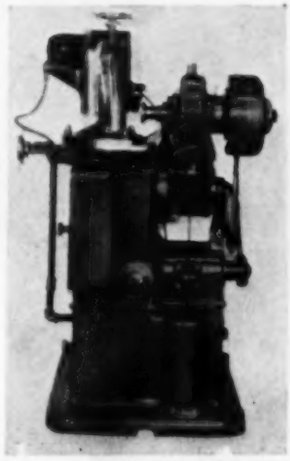
Fellows Gear Shaper Co., Springfield, Vt. [Vol.76,p.571.]

So-called "normal sharpened" helical gear shaper cutters may be sharpened on this fully automatic sharpening machine provided with complete electrical control. One motor reciprocates the table, another drives the coolant pump, and the third drives the grinding wheel. Cutters having helix angles up to and including 50 deg. and up to 5 in. P. D. can be sharpened.

Cutter Resharpening Machine, Helical-Gear

National Tool Co., Cleveland, Ohio. [Vol.76,p.346.] 127.

Helical gear-shaper cutters can be resharpened to produce gears of true involute form by this machine. Cutting edges are provided in the plane of the revolution of the cutter by in-

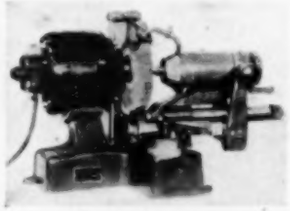


tersecting the involute helicoid side faces of the teeth with an involute helicoid of opposite hand. A rack wedge is required for each base circle diameter and is inserted and removed without the use of tools. The machine operates at 35 indexes per min.

Drill Sharpener

Wells Mfg. Co., P. O. Box 613, Greenfield, Mass. [Vol.76, p.414.] 123.

The No. 13-D drill rounder rounds the sharp corners of drills to increase their endurance, allow higher speed and



obtain a smoother hole. The No. 13-F sharpener is for drills from ¼ to 1¼ in. Both machines have diamond truing devices attached. Both are portable.

Grinder, Tool

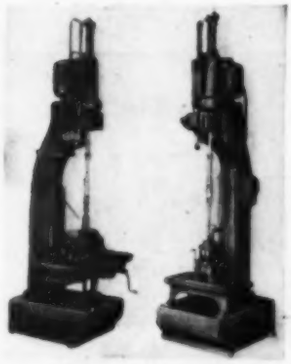
Ransom Grinding Machine Co., Oshkosh, Wis. [Vol.76,p. 315.] 103.

The No. 107 tool grinder has been designed especially for grinding ordinary lathe and planer tools tipped with tungsten carbide. Grinding is done on cup wheels, and large tables have been provided so that the tool shank is amply supported.

Honing Machine, Hydraulic, No. 194

Barnes Drill Co., Rockford, Ill. [Vol.76.p.718.] 281.

Capable of honing all diameters, from 4 in. down to ¾ in., this No. 194 single-spindle, single-speed honing and lapping machine is of light design and has simplified hydraulic equip-

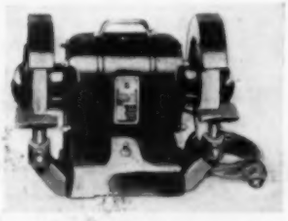


ment for spindle reciprocations without dwell or shock. It has maximum and minimum stroke of 8 in. and ½ in. Distance, center of spindle to face of column, 10¼ in.; maximum distance from base to spindle, 48¼ in.

Grinder, Bench

Sunlight Electrical Mfg. Co., Warren, Ohio. [Vol. 76,p.540.]

Premier ball-bearing bench grinders are being equipped with a flange-type "Wisconsin Guard." The guard can be re-

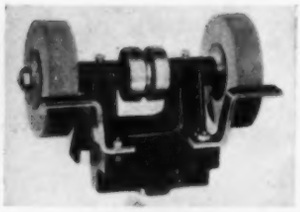


moved when buffing or polishing. Two sizes are available, the ⅓-hp., 1,750 r.p.m., and the ½-hp., 3,600 r.p.m.

Grinder, Bench

Modern Grinder Mfg. Co., 112 S. Second St., Milwaukee, Wis. [Vol.76,p.653.] 258.

The cast frame is provided



with two bracket-type adjustable tool rests. The 1¼x1½-in. pulley is arranged so that flat, V, or round belts may be used. The unit is supplied with two 4 or 5-in. grinding wheels. Height from base to center is 3½ in.; from wheel to wheel, 5½ in.

Motor-Driven Oilstones

Pike Mfg. Co., Pike, N. H. [Vol.76,p.509.] 176.

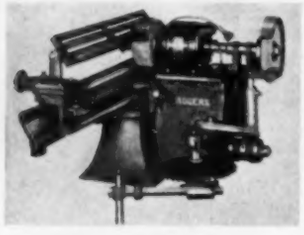
Both these machines are portable, powered with universal motors that operate from any light socket, and are equipped

with gravity oil feeds and felt wipers. The No. 50 will handle all tools with broad, flat edges. The No. 60 puts an oilstone finish on cutting tools that cannot be oilstoned on a regular bench stone.

Grinder, Utility, Type "K"

Samuel C. Rogers & Co., 191-205 Dutton Ave., Buffalo, N. Y. [Vol.76,p.508] 175.

This combination bench grinder is equipped with a table for face, surface, knife or die grinding, a tool rest for edge tool grinding, and an attachment for



sharpening circular saws up to 22 in. in diameter. On special order it is obtainable equipped with a 10-in. disk grinding wheel and adjustable table, or with flexible shaft.

Surfacer and Polisher, Bench, Abrasive-Belt

Production Machine Co., Greenfield, Mass. [Vol.76,p. 155] 35.

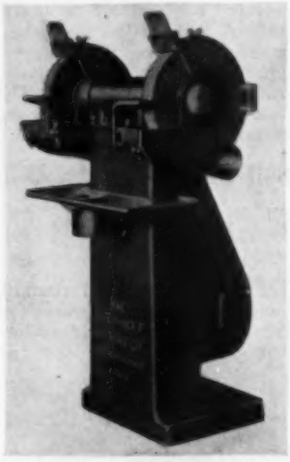
A bench-type No. 601 machine for removing burrs, cleaning up castings, straightening, smoothing and polishing tools, dies and stampings has been de-

veloped. The work table is 7½ in. long by 4½ in. wide with an adjustable gage. The endless abrasive belt is 35 in. long by 4 in. wide.

Grinder, Texdrive

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.76,p. 156] 30.

In this Texdrive grinder for 10-, 12- and 14-in. vitrified or high-speed grinding wheels, large ball bearings or Timken roller bearings are mounted on

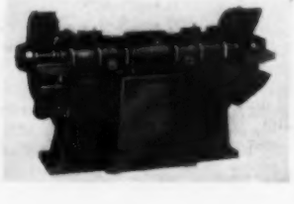


the shaft. Bearing boxes, which are keyed to the pedestal, can be removed as a complete unit with the shaft.

Grinder, Floorstand, Independent-Spindle

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.76,p.747.] 280.

This machine uses either Bakelite or rubber-bonded wheels as well as vitrified wheels. It has two independent spindles. Constant wheel-periph-



ery speeds can be maintained on each spindle from largest diameter to scrap size by equipping the machine with the Hammond variable-speed pulley.

Grinder, Vertical, "Standard"

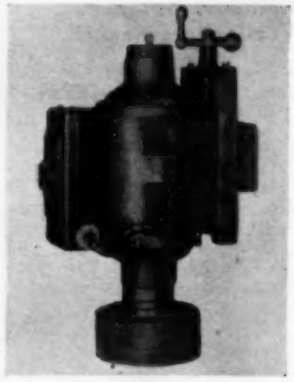
Standard Electrical Tool Co., 1938-46 W. Eighth St., Cincinnati, Ohio. [Vol.76,p.251.] 94.

This vertical grinder for attachment to a planer or other machine tool is especially adapted for grinding dies or for surface grinding. S K F ball bearings are employed throughout. The machine is equipped with a cup wheel 7 in. diameter, 1¼-in. wall. Sizes from 3 to 10 hp. are made.

Filter, Industrial, "Sorwal"

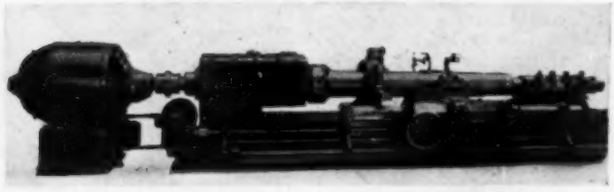
Electric Auto Lite Co., Champlain St., Toledo, Ohio. [Vol. 76,p.653.] 331.

Claimed to save as high as 44 per cent in grinding wheel cost because the wheel does not load up, and capable of filtering all makes of grinding compound, kerosene, light oils and similar liquids, this industrial filter is intended for installation on



grinders, lapping or honing machines. It is claimed to permit use of a finer grit wheel, thus cutting down scratching.

Lathes



Lathe, Engine, 22-In., 100-Hp.

American Tool Works Co., Cincinnati, Ohio. [Vol.76,p.378.]

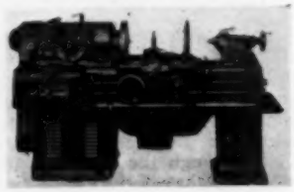
This super-powered, super-capacitated lathe, developed for the primary purpose of determining the maximum metal-cutting capacities of cemented carbide cutting tools, has spindle speeds from 33 to 1,200 r.p.m. and weighs 40,000 lb. Two separate spindle speed ranges are provided: one the high-speed, or direct, range furnishes 70 speeds obtained through the 100-hp., d.c., 6 to 1 motor. The second, or backgeared, range provides the same number of speeds. Carriage guides are faced with hardened steel strips.

The feed mechanism functions independently of the lathe spindle. Through a 50-contact rheostat and a two-speed mechanical unit it provides 100 rates of carriage feed, from 1¼ to 43½ in. per min. A motor-driven chip conveyor is provided.

Lathes, Engine, Geared-Head

Sidney Machine Tool Co., Sidney, Ohio. [Vol.76,p.27.] 4.

Four additional "Tritrol" 16-speed, geared-head engine lathes comprise 14, 16, 18 and 20-in. sizes, which now complete a line ranging from 14 to 36 in. capacity. The geared headstock is equipped with her-

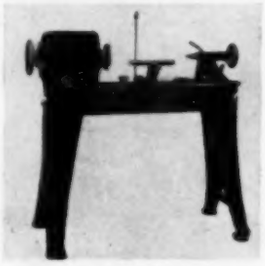


ringbone continuous-tooth gears of 30 deg. helix angle. The quick-change gearbox is also completely equipped with anti-friction bearings, and has alloy steel gears giving 48 changes. Threads range from 1¼ to 92 per in.; feeds from 0.0027 to 0.172 in.

Lathe, Motor-Headstock

Oliver Machinery Co., Grand Rapids, Mich. [Vol.76,p.190.]

Intended for use in schools and pattern shops, this No. 51 motor-headstock lathe has a swing of 12 in. The headstock contains a built-in, ½-hp. ball-bearing motor, and the speeds are 600, 1,200, 1,800 and 3,600

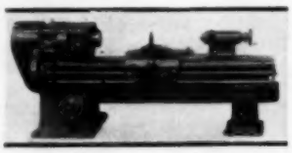


r.p.m. A built-in control located at the front side of the headstock includes start and stop buttons, a speed change lever and overload and low-voltage devices.

Lathe, High-Speed, T. C.

R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. [Vol.76, p.438.] 157.

This production lathe, developed especially for use with cemented carbide tools, has a Timkenized helical-geared head, and is driven by a 25-hp. variable-speed motor. Spindle



speeds range from 150 to 2,400 r.p.m. V-belt drive is employed. The spindle is short to eliminate deflection. Feed gears are mounted on Timken bearings. Nine feed changes range from 0.002 to 0.025 in. The bed is equipped with hardened and ground Nitralloy ways.

Lathe With Timken Bearings

Cincinnati Lathe & Tool Co., 3207-3211 Disney St., Oakley, Cincinnati, Ohio. [Vol.76,p.710.]

All sizes of Cincinnati geared-head lathes are now available with either bronze or anti-friction bearings. The headstock is furnished with Timken roller bearings. Twelve mechanical spindle speeds in geometric progression and 32 feeds from 0.004 to 0.240 in. are provided.

Lathes, Engine

Rockford Machine Tool Co., Rockford, Ill. [Vol.76,p.801.] 318.

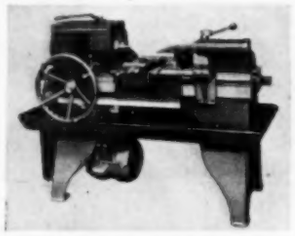
By us of a Westinghouse-Wise drive, this engine lathe

with complete spindle speed changes costs about the same as a cone-head lathe. Back-gears are included. Any of 32 thread-leads or feeds are secured by shifting levers. The sizes are 13⅞, 14⅛ and 17⅛ in. swing. Corresponding distances between centers are 27, 37 and 51 in.

Lathe, Stub, Junior

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.76,p.569.]

Greater strength, weight and rigidity to apply 2½ to 3 times the usual power are incorporated in the "Junior" stub lathe. Speed range and feeds are suitable for use of cemented carbide



and diamond tools. Capacity between centers is 18 in.; swing over bed ways 12 in.; swing over tool-slides, 8 in.; hole through spindle, 1⅛ in. Spindle runs counter-clockwise.

Lathe, Stub, 8-In.

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.76,p. 682.] 276.

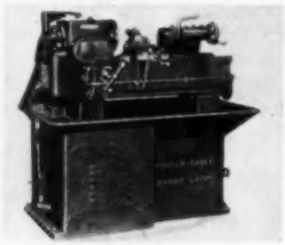
Bed and headstock are a rigid one-piece casting with a much larger chip opening. The standard front carriage now has provision for mounting taper or form-turning attachments. Max-

imum capacity between centers is 10½ in. Highest of three ranges of spindle speeds is suitable for cemented-carbide tools. A combination clutch and brake controls the spindle, which has provision for draw rods and pneumatic chucks or fixtures.

Lathe, "Super Carbo-Lathe"

Porter-Cable Machine Co., Syracuse, N. Y. [Vol.76,p.772.]

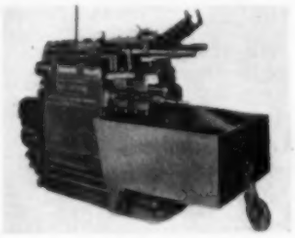
The bed and headstock have been strengthened. Two carriages can be used at once. Spindle speeds obtained with an 1,800-r.p.m. motor and low-geared head are 95 to 1,130, with feeds of 0.005 to 0.030 in. in six steps, and with high-geared head, 170 to 2,000 r.p.m., with feeds from 0.003 to 0.025 in. The lathe will turn 7 by 18 in. and for short, chucking work will handle pieces up to 12 in.



Lathe, Automatic

Seneca Falls Machine Co., Seneca Falls, N. Y. [Vol.76,p. 284.] 101.

For machining short stubby work, such as bearing races and gear blanks, this "Lo-Swing" Model K automatic lathe is of heavy design, weighing approximately 8,700 lb. It is practical to run the spindle at 2,000



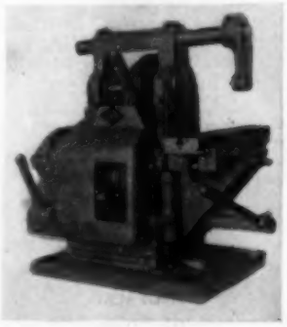
r.p.m. Anti-friction bearings are used throughout. The feed for the tool mechanism is obtained through cams. All other movements are actuated hydraulically.

Milling Machines

Milling Machine, Knee-Type No. 2

Frew Machine Co., 124 West Venango St., Philadelphia, Pa. [Vol.76,p.65.] 28.

This No. 2 "VeeDriv" motorized machine is a redesign of the No. 2 belt-drive hand miller. Specifications: table, 13¾ x 4½ in.; vertical adjustment under spindle center, 7½ in.; maximum

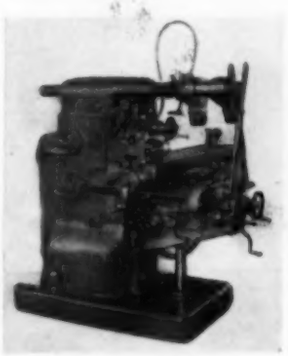


distance from spindle center to table top, 7½ in.; distance from spindle center to under side of overarm, 4½ in.; adjustment in line with spindle, 3¼ in.; table feed, 7 in.; taper hole in spindle, No. 9 B. & S.; spindle speeds 200 to 2,000 r.p.m.; motor, ¾ hp.

Milling Machines, Knee-Type, Nos. 2 and 3

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.76,p. 381.] 131.

Plain and universal machines are manufactured. The motor runs only when the cut is being

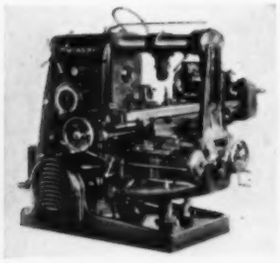


made. Thirty-two changes of spindle speed range from 20 to 1,300 r.p.m. Sixteen backgeared speeds range to 238 r.p.m. Thirty-two feeds from ¼ to 62 in. per min. provide a larger range than usual. Machines have these B. & S. features: double-overarm construction, standardized spindle end, one-piece elevating screw, anti-friction bearings in all main mechanisms, simplified oiling.

Milling Machines, Knee-Type, Nos. 3 and 4

Kearney & Trecker Corp., Milwaukee, Wis. [Vol.76,p.409.]

The line is now available in four sizes, each built in the universal, plain, and manufacturing horizontal types, and in the plain and manufacturing sliding-head vertical types. Construction details of the Nos. 3 and 4 are the same as those of the Nos. 1 and 2 (*AM*—Vol.75,p. 184). Features include: spindle speeds from 12 to 1,200 r.p.m.; feeds from ¼ to 60 in. per min.;

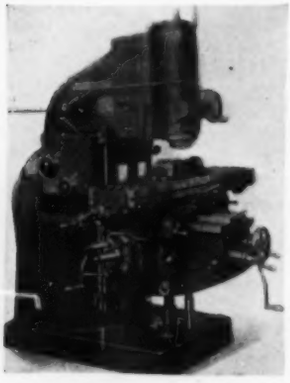


a center-bearing spindle with worm drive; a sponson-type knee; and a multiple V-belt drive. Power rapid traverse in six directions is provided.

Milling Machine Vertical, No. 1

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol.76, p.280.] 108.

It is possible on this machine to control completely all movements at both the front and rear operating positions. The table is provided with a semi-automatic cycle. Sixteen spin-



dle speeds range from 20 to 500 r.p.m.; table feeds from ½ to 20 in. per min. The range of the machine is: longitudinal, 22 in.; cross, 12 in.; vertical, 15 in.; head travel, 6 in.

Milling Machine Vertical, No. 1

Brown & Sharpe Mfg. Co., Providence, R. I. [Vol. 76,p. 474.] 165.

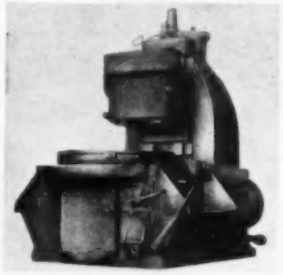
No. 1 "Standard" motor-driven machine provides a fast, sensitive unit for end mills and shell end mills, through spindle

speeds ranging from 150 to 1,800 r.p.m. in either direction. Cutting movements of both table and spindle are controlled from either front or rear. Feed changes of table and spindle and speed changes are made similarly.

Milling Machine, Vertical, Rotary-Type, 36-In.

Kearney & Trecker Corp., Milwaukee, Wis. [Vol.76,p. 570.] 205.

Developed for high-production manufacturing with the newer cutting tools, this rotary type vertical milling machine has a 36-in. table driven by a wormwheel. Eighteen table

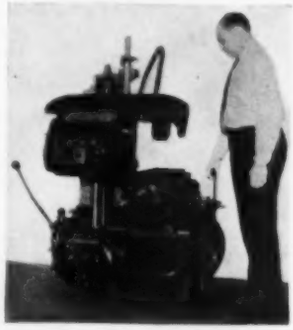


feed changes are by pick-off gears. Rapid return at 240 ft. per min. is provided. Head speed changes are by means of pick-off gears, and 18 spindle speeds are furnished in any one of four optional ranges of 15 to 150; 20 to 200; 30 to 300; or 50 to 500.

Milling Machine, Manufacturing

Kempsmith Mfg. Co., Milwaukee, Wis. [Vol.76,p.248.] 97.

Equipped with a hydraulic circuit, the "Kemp-S-Mill" differs from standard production millers, in that, while the control of the feed rate may be predetermined and automatically



actuated, the feed rate can be changed entirely at the will of the operator by a centralized control lever, dually applied. Having a working surface of the table of 26x8 in. and a longitudinal travel of 14 in., the machine is designed for processing the average run of small parts as well as shuttle milling. Spindle speeds to 1,800 r.p.m. are provided.

Milling Machine, Manufacturing, Rigidmil, No. 3-B

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.76,p.716.]

A high-speed drive for use with new cutting alloys is available for application to the standard head at any time, bringing the spindle speed from a maximum of 241 to 668 r.p.m. The spindle now has selected anti-friction bearings

throughout. An increased range is also available for the feed box. The spindle can be mounted either horizontally or vertically. The table can be reciprocating (6 lengths, 2 widths) or rotary, with continuous feed or alternating feed and automatic rapid traverse.

Milling Machine, Sliding-Housing

Sleeper & Hartley, Inc., Worcester, Mass. [Vol.76,p. 714.] 209.

The machine is capable of finishing surfaces in 5 planes without changing the position of the piece on the table. Holes in the vertical plane may be bored or tapped. The table is stationary and the housing with its rail and spindle head travel over the work on ways. The

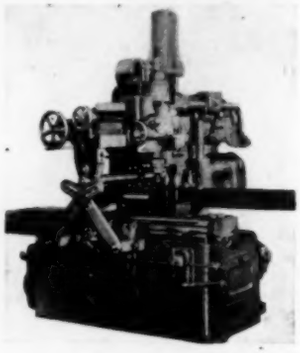
fixed bed is claimed to reduce required floor space about 30 per cent. It is possible to cross-traverse or cross-feed while the head travels lengthwise on the table. The cross-rail is also power-actuated.

Specifications are: distance between housings, 6 ft. 2 in.; maximum height of cutter, 50 in.; vertical travel of spindle, 15 in.; capacity of machine, 14x8 ft. Spindle speeds range from 16 to 49 r.p.m. on the back-gear; 102 to 307 r.p.m. on direct gear. Spindle feeds are from 0.001 to 0.270 in.

Milling Machine, Keyway

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol. 76,p.440.] 158.

Keyways in shafts from 1 to 18 in. in diameter can be milled on this machine built up from "Hydromatic" units. The straight section of the keyway is milled by a slotting cutter,

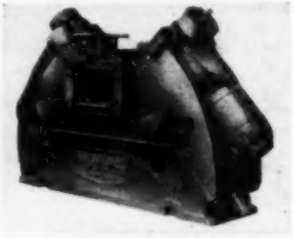


and at the same setting the ends are rounded out by an end mill in a vertical spindle. All controls are centralized at the normal operating position. Any table feed up to 40 in. per min. is available.

Milling-Machine, Cylinder-Block, Six-Spindle

Kearney & Trecker Corp., Milwaukee, Wis. [Vol.76,p.654.]

Milling three exhaust pads on each side of a V-8 cylinder block is done on this machine designed for using tungsten carbide. Two 3-spindle heads, one

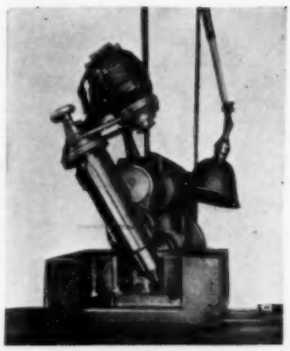


at each side of the bed, are mounted on angular slides. Individual feeds to each head are available. Feed changes are made by pickoff gears. Spindles are mounted in quills for individual adjustment.

Milling Head, High-Speed

Neff Kohlbusch & Bissell, 2400 West Madison St., Chicago, Ill. [Vol.76,p.188.] 59.

Double pivot construction is used in this high-speed milling head to make possible the positioning of the spindle at any angle and at any height within the scope of the two centers. This allows the cutter to be used at a point below the regular spindle of the milling

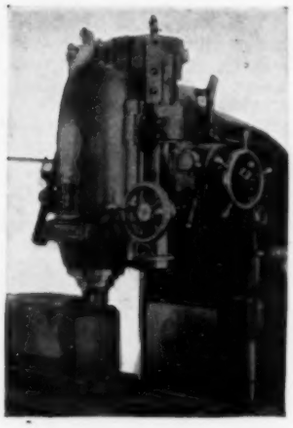


machine, and also at a point practically flush with the bottom of the overarm. Speeds are 800, 1,400, 2,400 and 4,000 r.p.m. The spindle accommodates ½-in. collets.

Turret Stop, 4-Position

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol. 76,p.347.] 125.

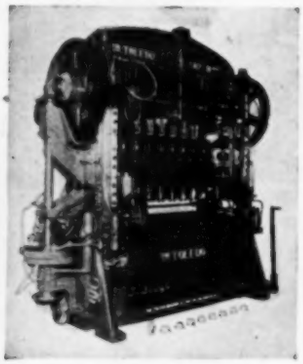
This 4-position turret stop and dial indicator arrangement for use with Cincinnati vertical knee and column type milling machines, Sizes 1, 2 and 3, provides quick, accurate setting of the spindle to various positions for step milling. Jig boring and die sinking can be performed also.



Measuring Equipment for Milling Machines

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol. 76,p.802.] 311.

Jig boring and die-sinking operations can be undertaken with Cincinnati milling machines when fitted with precision measuring equipment, which consists of one dial indicator, one micrometer head and a set of standard measuring rods for each movement.



Press, Inclinable, Open-Back

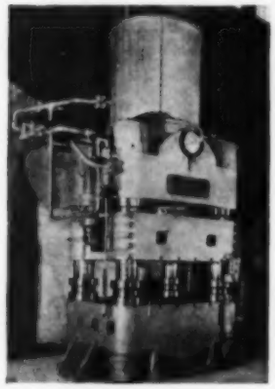
Loshbough-Jordan Tool & Machine Co., Renn St. and Sterling Ave., Elkhart, Ind. [Vol.76,p.510.] 191.

Made in three styles—flywheel, geared and combination geared—in the flywheel type the press is capable of delivering approximately 40 tons pressure. Advantages are large die space, deep throat, large bolster plate area, large opening in bed, large opening in back and low bedplate when inclined.

Presses, Platen, "Hydro-Power"

Hydraulic Press Mfg. Co., Mount Gilead, Ohio. [Vol.76, p.216.] 32.

These presses are available in eleven pressure capacities from 100 to 2,000 tons, each in three square platen sizes ranging in 12 in. increments from 24x24 to 72x72; also in the openside



type, the sizes in this type being from 36x24 to 84x60 in. They are operated by the oil pressure "Fastraverse" system, which gives rapid ram travel to the work, a slower pressing speed, and rapid return of the ram.

Presses

Press, Four-Point Suspension

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.76,p.150.]

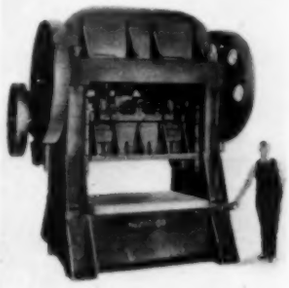
This press has the crankshafts geared together and synchronized to operate simultaneously. Dimensions are: area of bed, 80 by 120 in.; opening in bed, 60 by 112 in.; area of

slide, 75x113 in.; stroke of slide, 18 in., with 6 in. adjustment; die space, distance from top of bolster to under face of slide, stroke down, adjustment up, 38 in.; weight, about 300,000 lb.

Press, Straight-Sided, Double-Crank

Henry & Wright Mfg. Co., Hartford, Conn. [Vol.76,p.250.]

This 350-ton, all-steel, double-crank, straight-sided press is representative of the company's presses of welded construction. It is double-geared with twin-gear drive. Major specifications are: distance between uprights, 68 in.; stroke, 8 in.;

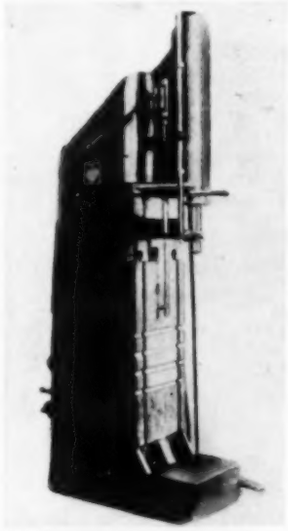


shut height, 18 in.; adjustment of slide, 4 in.; area of bolster, 47x66 in.; opening in bed, 34x50 in.; number of strokes per min., 17; weight, 49,000 lb.

Press, Double-Crank, with Automatic Feed

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.76,p.800.]

The press is of the double-crank type with twin gears on the crankshaft. Distance between the uprights is 84 in. Each of the eight punch slides is individually adjusted, and counterbalanced by a pair of air cylinders to assure smooth running.



Presses, Horning, Hydraulic

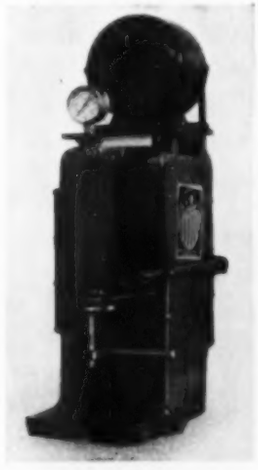
American Broach & Machine Co., Ann Arbor, Mich. [Vol.76,p.413.] 148.

Specifications of the 6-ton horning press are: Stroke, 21 in.; distance from ram to finished surface, 9¼ in.; height of finished surface on base from floor, 8 in.; maximum daylight, 51 in.; down speed of ram, 20 ft. per min., and weight of machine, 3,900 lb. Specifications of the 12-ton horning press are the same except for: down speed of ram, 24 ft. per min., and weight, 4,200 lb.

Press, Hydraulic, Bench

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 76,p.314.] 118.

Type V-000 hydraulic bench press is of ⅓-ton capacity. Ram operates at 90 ft. per min., with return at 120 ft. per min. The work table is 7 in.



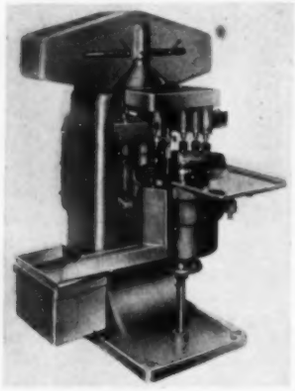
wide, and the depth of throat is 2 in. Specifications: stroke, 5¼ in.; diameter of ram, ½ in.; width of table slot, 1⅛ in.; height to top of cylinder, 14¼ in.; weight, 140 lb.; motor, ½ hp., 1,800 r.p.m. The machine is arranged for motor drive only, utilizing Texrope. A gage shows the pressure on the ram in lb. per sq.in.

Tapping and Threading Machines

Tapping Machine, Dial

Hydro-Machine & Tool Co., Inc., 488 John St., Bridgeport, Conn. [Vol.76,p.537.] 174.

This reversing-type tapping machine reverses the spindles for performing threading and backing out by means of a hydraulic piston connected to a rack meshing with a train of gears, the piston being double-

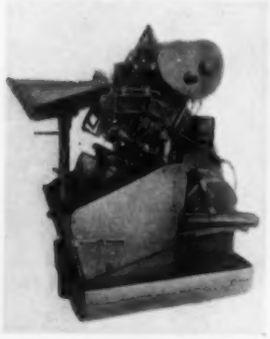


acting. The tapping spindles make up to 15 revolutions in either direction. Maximum number of spindles is 12. A dial controls from 1 to 50 cycles per min. Capacity is eight $\frac{7}{16}$-in. taps in $\frac{1}{2}$-in. steel. Production is from 20 to 80 pieces per min.

Forming and Threading Machine, Automatic, with Stud Attachment

Landis Machine Co., Inc., Waynesboro, Pa. [Vol.76,p.312.] 81.

This attachment adapts the Landis automatic forming and threading machine to manufacture of studs and increases the



production rating from 200 to 500 per cent. The attachment will accommodate studs from $\frac{1}{4}$ to $\frac{3}{4}$ in. in diam., from $1\frac{1}{2}$ to 6 in. in length, and with a $2\frac{1}{2}$ in. maximum thread length.

Threading and Cutting Machine, Pipe, 13⅜-In.

Landis Machine Co., Inc., Waynesboro, Pa. [Vol.76,p.29.]

This machine will thread any length up to 8 in. and any taper to $\frac{3}{4}$ in. per ft. on $4\frac{1}{2}$ to $13\frac{3}{8}$ in. O. D. pipe. Chaser holders

cover the range from $8\frac{1}{4}$ to $13\frac{3}{8}$ in.; chaser holder extensions, from $4\frac{1}{2}$ to $8\frac{3}{4}$ in.

Threading Machine, Pipe and Nipple

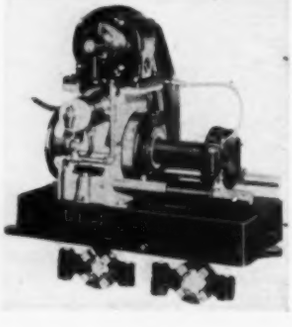
Landis Machine Co., Inc., Waynesboro, Pa. [Vol.76,p.443.] 141.

Several changes have been made in the "Landmaco" threading machine (*AM*—Vol. 74, p. 377) to adapt it to the production of pipe nipples. This $1\frac{1}{2}$-in.

machine is made in both single and double head models. Its range is $\frac{1}{4}$ to $1\frac{1}{2}$ in. with the externally tripped head and $\frac{1}{4}$ to $1\frac{1}{4}$ in. with the internally tripped head. The diehead may be opened and closed automatically or by hand.

Threading Machine, Pipe, Tom Thumb

Oster Mfg. Co., 2067 E. 61st Place, Cleveland, Ohio. [Vol. 76,p.655.] 236.



This low-priced portable machine with capacity for $\frac{1}{2}$- to 2-in. pipe can be furnished with a pipe cut-off attachment. Dies are of the segment type. A separate diehead is used for each different size of pipe.

Diehead with Roughing and Finishing Attachment

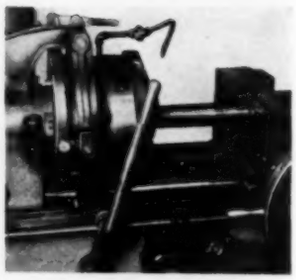
Landis Machine Co., Inc., Waynesboro, Pa. [Vol.76,p. 599.] 105.

This rotary diehead with roughing and finishing attachment is for use on the Landis 4-in. leadscrew threading machine. It is recommended for cutting coarse-pitch threads on work which requires great accuracy and an exceptionally smooth finish. The diehead will cut single, double, triple and quadruple threads from $\frac{3}{4}$ in. to 4 in. with a maximum lead of $\frac{1}{2}$ in.

Diehead, Self-Opening

American Die & Tool Co., Reading, Pa. [Vol.76,p.775.]

The "Red-E-Quick" auto-



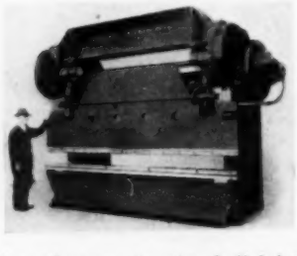
matic self-opening and quick-setting die head requires but two sets of dies to thread all sizes of pipe from $\frac{1}{2}$ to 2 in. inclusive. Means are also provided for adjustments.

Other Machines

Brakes, Bending

Steelweld Machinery Co., E. 70th St., & Machinery Ave., Cleveland, Ohio. [Vol.76,p.187.]

Welded-steel construction is employed for these bending brakes. The clutch is of twin-disk design, and operating levers move on ball bearings.

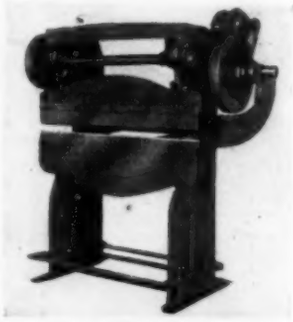


One feature is the ball-joint connection, claimed unbreakable. Slide bearings and eccentric straps are Meehanite iron. The flywheel is rolled steel mounted on Timken bearings. Eccentrics are forged solid with the mainshaft.

Brake, Press, Steel, No. 253

Dreis & Krump Mfg. Co., 74th St. & Loomis Blvd., Chicago, Ill. [Vol.76,p.683.] 262.

Designed to handle 14 gage up to 3 ft. wide over $\frac{1}{8}$-in. die and 16 gage up to 4 ft. wide over $\frac{1}{4}$-in. die, this small all-steel press brake is powered by a $\frac{3}{4}$-hp. motor. The unit is

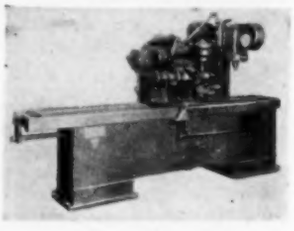


adapted particularly for rapid forming of wide sheets of sheet metal. Die-holders are standard and can be used on large press brakes.

Brinelling Machine, Automatic

Millholland Corp., 1145 E. 22nd St., Indianapolis, Ind. [Vol.76,p.507.] 193.

This automatic machine for testing the hardness of crankshafts and other forgings on a production basis comprises a Millholland No. 4 milling unit used in conjunction with a Brin-

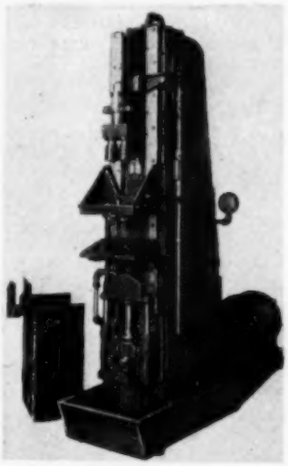


ell testing apparatus. Except for loading and unloading the machine is entirely automatic. One man can handle approximately 100 crankshafts per hr.

Broaching Machines, Vertical, Hydraulic

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 76,p.445.] 136.

Pull-type machines are either semi-automatic or full-automatic, and operate one or more broaches. Models V-52, V-42, and V-32, designate maximum length of broach used. The first two machines admit work up to 13 in. in diameter and



afford a normal working pressure of 12 tons; the last machine, work up to 11 in., capacity, 6 tons. Cutting speeds are respectively, 24, 28 and 24 ft. per min. Push-type machines are operated on a semi-automatic cycle, and the several sizes take broaches from 32 to 58 in. long.

Bulldozer with Power Adjusted Dieholder

Steelweld Machinery Co., E. 70th St. & Machinery Ave., Cleveland, Ohio. [Vol.76,p.439.] 164.

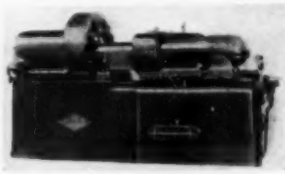
It has been found that the time of changing and setting-up bulldozer dies is a more important element of cost than actual bending. The dieholder is adjusted by a worm and

wheel driving screws. A push button operates the machine. This bulldozer has an all-steel frame in which the gearing is inclosed. Crank and ram pins are of heat-treated special steel.

Burnishing and Grooving Machine, Automatic, Hydraulic

Rockford Drilling Machine Co., Div. of Borg-Warner Corp., Rockford, Ill. [Vol.76,p.189.] 29.

This automatic machine is for surface burnishing and grooving of two parts at a time. Machine head and indexing drum fixture are automatic in operation and speed is adjustable. A

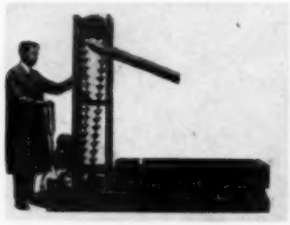


7½-hp. motor furnishes drive. The four spindles are mounted in Timken roller bearings. The special grooving and burnishing tools are guided by bushings carried in a separate bracket.

Burnishing Barrel Loader

Abbott Ball Co., Hartford, Conn. [Vol.76,p.773.] 304.

This portable motor-driven machine is used for loading burnishing balls into a battery

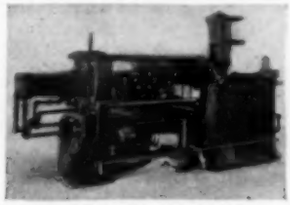


of burnishing barrels. Reloading the barrel can be started while a load of burnished materials is being riddled.

Die-Casting Machine

Reed-Prentice Corp., Worcester, Mass. [Vol.76,p.217.] 77.

This hydraulically operated, pressure-type die-casting machine, designed for producing white-metal castings, has a capacity of 150 to 450 shots per hour. Die space ranges from 6 to 17 in. Locking pressure is



120,000 lb. Casting temperatures from 800 to 820 deg. F. are possible. Pot temperature is thermostatically controlled. The machine can be run at seven speeds.

Die-Making Machine, Model P-4

Oliver Instrument Co., Adrian, Mich. [Vol.76,p.251.] 83.

The Model P-4, which has capacity for sawing tool steels 2 in. thick, is now fitted with a screw-feed sawing attachment

to minimize saw breakage. In addition, hold-down fingers are now attached directly to the overarm, which may be swung away from the file.

Forming Machine, Open-Side, O W Series

Yoder Co., Walworth Ave. at W. 58th St., Cleveland, Ohio. [Vol.76,p.655.] 248.

Each unit is furnished with a roll irrigating device which flushes all rolls and contact points. The electric control box is equipped with the usual

push buttons and also an "inching" button. Bearings are installed at the end of the shafts outside the forming rolls to permit easy adjustment of the roll pressure and quick roll changes.

Forming Machine, Sheet Metal

Engineering & Research Corp., 2014 Fifth St., N.E., Washington, D. C. [Vol.76,p. 711.] 265.

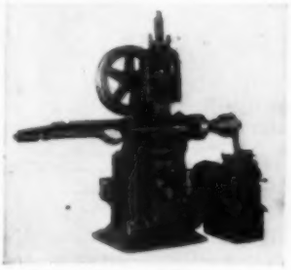
All types of flanging may be done on this sheet metal former. It consists of a short brake, 3 to 4 in. long, oscillating approximately 260 times a minute. The

angle through which it oscillates is controlled by means of a treadle and may be varied from 0 to 100 deg. Metal to be worked is fed through a hold-down tool. The machine will take from 0.12- to 0.083-in. stock.

Hammering Machine, Special

Langelier Mfg. Co., Providence, R. I. [Vol.76,p.686.]

Used to hammer the section at the end of automobile rear axle housings to which is attached the spring perch, this special hammering machine re-



duces diameter of the tube, increases wall thickness, and makes the tube round and to size within tolerance of ± 0.002 in. The machine is constructed on the swaging principle.

Header, Automatic, Electric

National Machinery Co., Tiffin, O. [Vol.76,p.711.] 266.

Cold stock, fed into the machine, is cut to length, heated to the necessary forging temperature by multi-stage localized electric heating, then headed. The machine can be arranged for feeding the stock from a coil or can be equipped with a magazine for feeding blanks.

Marking Machine, Bar-Stock, Continuous

Noble & Westbrook Mfg. Co., 20 Westbrook St., East Hartford, Conn. [Vol.76,p.684.]

Continuous inscription of a trade mark on bar stock from ¾ to 1 in., at a speed of 110 to 140 ft. per min., can be done

readily with this machine. Adjusting screws allow for quick change for marking different sizes of stock.

Nibbling Machine, Turret-Head

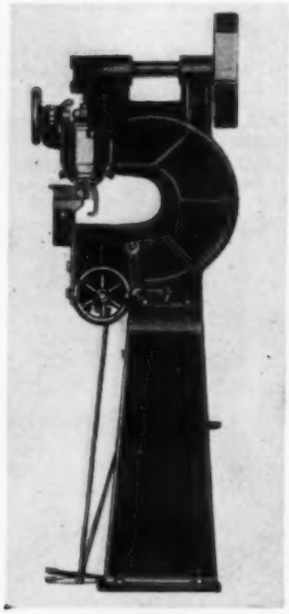
Gray Machine Co., Box 596, Philadelphia, Pa., plant at 7th & Wood St. [Vol.76,p.313.]

The turret head allows the operator to cut shapes of any design in sheets or plates without the necessity of turning the stock through the gap or throat. The turret may be locked in

eight different positions. A feature is the double-micrometer adjustable strippers. The machine is built in several sizes, capable of cutting stock of the thinnest gages and up to 1-in.

Nibbling Machine for Formed Sheets

Gray Machine Co., Box 596, Philadelphia, Pa. [Vol.76,p. 441.] 160.



This special turret head metal cutter for formed sheets has a bottom die mounted on a sliding member which has guides to allow the die to drop from 4 to 6 in. downward. This gives greater clearance for flanged sheets. Two individually adjusted strippers are also part of the equipment. When the pieces are small enough to turn in the throat, the turret head may be locked in any position through 180 deg.

Nibbling Machine, No. 312

W. J. Savage Co., Inc., Knoxville, Tenn. [Vol.76,p.572.] 208.

Increased capacity of ½ in. and generally improved design features the No. 312 nibbler-type machine. Revolving head and stripper have been redesigned to add strength to cut-

ting members and increase bearing surfaces. Multiple V-belt drive is provided. Improved cutting tools and toolholder have full provision for cutting to the line or to a templet.

Pipe Fitting Machine, "Douglass"

H. A. Brassert & Co., 310 S. Michigan Ave. [Vol.76,p.64.] 19.

The Douglass pipe fitting machine is designed to cut automatically by the oxy-acetylene torch pipe of 2 to 18 in. for fabrication into welded tees, miter elbows and bull plugs. It also bevels plain end pipe for butt welds. Mechanical move-

ment of the cutting torch is a combined rotating, longitudinal and angular motion so that the correct bevel is produced in the pipe at any point. By the use of two heads on the machine the header pipe and the branch pipe may be cut simultaneously with the same generating mechanism.

Planer, Wood, No. 361

Oliver Machinery Co., Grand Rapids, Mich. [Vol.76,p.745.]

For larger pattern shops, the No. 361 single wood planer is built in two sizes to plane 30 and 36 in. wide and up to 8 in. thick. All moving parts are

mounted on ball bearings. The head is balanced to run at any high-frequency planer speed desired, but is normally operated on 60 cycles, giving 3,600 r.p.m. Four standard feeds of 20, 40 and 60 ft. per min. are provided.

Plating Barrel

Udylite Process Co., Detroit, Mich. [Vol.76,p.474.] 166.

Barrel-type plating machines are available in bale and lift-arm types. Tanks are of double-welded sheet steel. Lined cypress tanks or rubber-lined

steel tanks can be provided. Tanks can be equipped with heating or cooling coils. Hard rubber cylinders are suspended in cast hanger frames with cathode connecting points cast integral.

Plating Machine, Automatic, Barrel-Type

Mitchell Engineering Co., Walnut St. at Main, Springfield, Ohio. [Vol.76,p.348.] 130.

Small parts are loaded into perforated drums made of insulating material and then conveyed through the cleaning,

rinsing, plating and drying operations automatically, and then unloaded automatically. While the drums are being conveyed through the various solutions, they rotate to expose all surfaces of the parts. A variable-speed mechanism permits regulation of the time of deposit.

Polishing and Buffing Lathe, Variable-Speed

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.76,p.283.] 124.

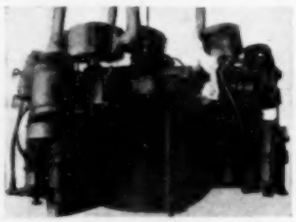
Constant peripheral speeds for buffing wheels from their largest diameter down can be secured with this variable-speed polishing and buffing lathe because of the Hammond variable-

speed pulley, permitting variations of speed between the low speed and 50 per cent above it. The machine is made in 3, 5, 7½ and 10-hp. sizes, either in single or two-spindle types with independent spindle-speed control.

Polishing and Buffing Machine, Rotary, Automatic

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.76,p.28.] 3.

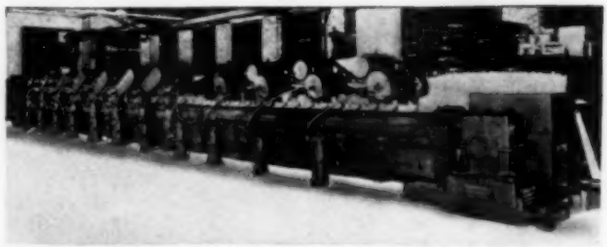
Whether the work to be polished is round, flat or bevelled, means are incorporated so that the desired finish may be obtained with simple adapters. The table can be supplied with an indexing, continuous or reciprocating motion, and with a combination of these three. The polishing and buffing heads are driven through multi V-belts from individual motors. Wheel speeds can be varied. The spindles also have a self-contained oscillating feature.



Polishing and Buffing Machine, Straight-Line, Automatic

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.76,p.253.] 85.

This straight-line automatic polishing and buffing machine is not limited in width, number of wheels or length. One of the features of this machine is the caterpillar-type conveyor unit. The polishing and buffing heads are complete motor-driven units. Drive is furnished by V-belts, and the speed can be varied.



Polishing Machine, Straight-Line

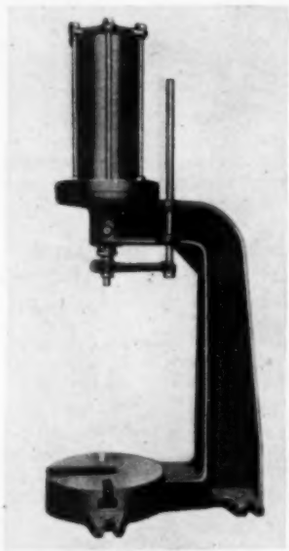
Excelsior Tool & Machine Co., 30th to 32nd Sts., East St. Louis, Ill. [Vol.76,p.774.] 303.

Bumpers with wide oval or corrugated face and higher curves are polished on this straight-line machine which is provided with a 12-in. wheel rise and heads spaced farther apart. Each unit is equipped with a 10-hp. motor connected to the spindle by V-belts. Double dust spouts reduce dust hazard. A Reeves adjustable speed regulator for driving the belt conveyor is another improvement.

Presses, Arbor, Air-Operated

Hannifin Mfg. Co., 621-631 S. Kolmar Ave., Chicago, Ill. [Vol.76,p.601.] 212.

With a distance from table to ram of 11 in. and from center of ram to back of throat of 8 in., this Series A-1 is furnished in five sizes to deliver pressures ranging from 565 to 6,280 lb. at 80 lb. air pressure. Any length of stroke may be specified up to 10 in. Frames are of cast steel.



Riveting Machine, Mechanical

Norin Engineering Co., 355 Union Park Court, Chicago, Ill. [Vol.76,p.719.] 287.

Rivets are fed from a hopper through a stake in the riveter frame and moved step by step until inserted into a pair of holding fingers directly under the dies. The machine illustrated is capable of driving steel rivets up to ⅜ in.

Saw Bench, Variety, No. 70

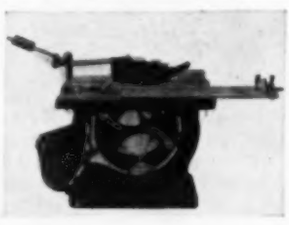
Oliver Machinery Co., Grand Rapids, Mich. [Vol.76,p.347.]

For use in pattern shops, the No. 70 variety saw bench is ball bearing equipped. Capacity for ripping is 24 in. wide with a plain fence, cross-cuts to 16 in. wide by 3 in. thick, or 19 in. wide by 1 in. thick with the regular 14-in. saw, which projects above the table 3 in. Saws up to 15 in. diameter and dados up to 4 in. wide may be used. The table measures 36x44 in. and tilts.

Saw, Double-Arbor, Motor-Arbor

Oliver Machinery Co., Grand Rapids, Mich. [Vol.76,p.31.]

Ripping, cross-cutting or mitering can be done without changing saws on this double-arbor, motor-arbor saw. Either a 16-in. rip saw or cross-cut saw, motor-on-arbor type, may be put into operation instantly by merely turning the hand-wheel, which swings the yoke carrying the two motor-driven saw arbors. The table measures 41½ x 44½ in. and tilts 45 deg.



Saw, Cut-Off, High-Speed

Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn. [Vol.76,p.155.] 41.

Hard or tough metals and alloys can be cut rapidly in the No. 48 high-speed cut-off machine. A 7½-hp. motor running at 3,600 r.p.m. drives the cutting disk. The spindle runs at 5,200 r.p.m., producing a wheel speed of 16,000 ft. per min.

Sawing Machine, Metal, High-Speed, No. 10

Peerless Machine Co., 1615 Racine St., Racine, Wis. [Vol. 76,p.252.] 93.

Two speeds are standard in this 10x10-in. capacity machine, one 90 strokes per min. for tool steels, the other 140 strokes per min. for machine steels. A motor stand is built integral. V-belt drive is used for the motor equipment. Either a full swivel vise or a plain straight cutoff arrangement is provided for.

Saw, Arc Cutting, "Alternarc"

Electric Arc Cutting & Welding Co., 152-160 Jelliff Ave., Newark, N. J. [Vol.76,p.412.]

In this arc cutting saw the

cutting wheel is one electrode and the work is the other. A current of several hundred amperes at low voltage passes between the cutting wheel and the work, the wheel revolving and pressing a new and cool surface to the work.

Saw Sharpener

Samuel C. Rogers & Co., 191-205 Dutton Ave., Buffalo, N. Y. [Vol.76,p.656.] 198.

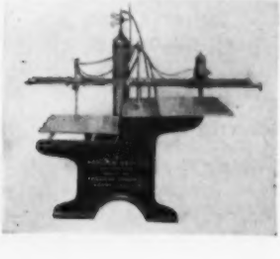
A bench-type automatic slitting-saw sharpening machine, designed for metal-cutting saws 2 to 16 in. in diameter, is being

manufactured. An index or ratchet feed plate is a feature. By its use a worn or damaged saw can be sharpened or recut with perfect teeth of any desired shape, with uniform spacing.

Shape-Cutting Machine

American Oxycop Co., Niagara Falls, N. Y. [Vol.76,p. 539.] 201.

The Hancock coal-gas, flame-cutting machine, an English invention, operates with ordinary illuminating gas under normal pressure in conjunction with

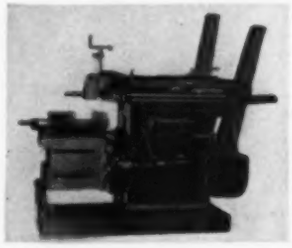


oxygen. The manufacturer claims speeds of 12 in. per min. through 1-in. steel, and 9 in. per min. through 3-in. steel. Maximum capacity is 8-in. steel. Machines are supplied from 24x18-in. to 15x4-ft. capacity.

Shapers, "Industrial"

Gould & Eberhardt, Newark, N. J. [Vol.76,p.345.] 129.

Twenty-two models are offered in the line of "Industrial" shapers, in sizes from 16 to 32-in. stroke. Low operating height is one feature. Rapid power traverse to the work table is built-in, and operates opposite to the feed set. The table is traversed in either direction at 100 in. per min. by a self-releasing control, which



automatically reinstates the feed. Automatic cross feed to the table is operated by a cam synchronized with the return stroke of the ram. Sixteen changes of feed from 0.012 to 0.200 in. are available. The vise has jaws projecting over one side of the table to permit end shaping.

Shaper Tool Lifter

Gould & Eberhardt, Newark (Irvington), N. J. [Vol.76,p. 629.] 232.

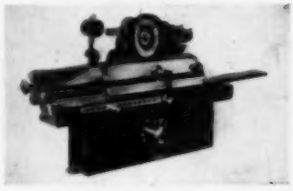
Developed for lifting the tools on return stroke, this shaper tool lifter is applicable to all G. & E. shapers. It is composed of an actuating rod and a lever at the side of the clapper

box. A compensating arrangement takes care of vertical and angular movement of the tool slide or offset of the box, and the lifter can be disconnected when not required.

Sharpening Machine for Hacksaw Blades

L. & L. Mfg. Co., 54-58 Springdale Ave., East Orange, N. J. [Vol.76,p.628.] 237.

Teeth are ground at a true right angle with the line of cutting of the blade and blades may be resharpened three times. The grinding wheel is mounted on a frame which swings alter-

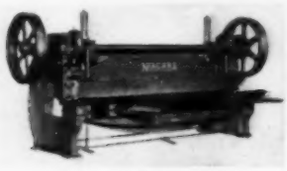


nately up and down under cam control. Indexing and gaging is by means of a master feed blade. Blades up to 21 in. long from $\frac{3}{8}$ to $1\frac{1}{2}$ in. wide, of any thickness and with any tooth pitch can be reclaimed.

Shear, Squaring

Niagara Machine & Tool Works, Buffalo, N. Y. [Vol. 76,p.774.] 310.

This shear with spring foot hold-down cuts $\frac{1}{4}$-in. plates in 10-ft. lengths. It is available with a 1-in. or an 18-in. gap in the housing. Combination of



steel and cast members provides rigidity and lightness. The back gage is self-measuring to $\frac{1}{64}$ in.

Back Gages, Improved, for "Cincinnati" All-Steel Shears

Cincinnati Shaper Co., Elam St. & Garrard Ave., Cincinnati, Ohio. [Vol.76,p.412.] 150.

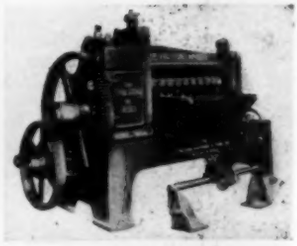
These heavy, ball-bearing, direct-reading back gages have adjusting screws connected to work in unison. One end of the straight edge is independently

adjustable outward. The gage bar abuts a stop in the parallel position. The direct-reading dial is graduated in inches and sixty-fourths.

Slitting Machine, Gang

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.76,p.652.]

Designed to cut a sheet of indefinite length into any desired number of strips without camber, the capacity of this machine is 25 cuts in 0.025-in. thick steel with a maximum distance apart of the outer cutters of 36 in. Minimum distance between cuts with standard adjustable cutter hubs and burrs is $5\frac{3}{4}$ in., while the distance with

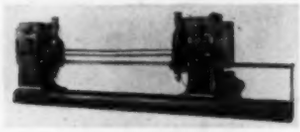


the burrs up and down is $3\frac{3}{4}$ in. However, by the use of packed cutters it is possible to cut strips as narrow as $\frac{1}{2}$ in.

Soldering Machine, Electric

Thomson-Gibb Electric Welding Co., Bay City, Mich. [Vol. 76,p.600.] 222.

A special application of direct-controlled heating by the electrical resistance method, developed for rapid soldering of from 3 to 12 copper tubes on which are assembled a large



number of flanged fins, is embodied in this machine. Tubes to be soldered are covered with solder, the fins assembled, soldering acid applied, and the unit clamped in the machine, and current turned on.

Splitting Machine, Brake-Drum

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.76,p. 188.] 44.

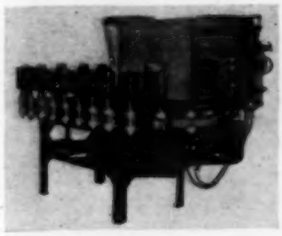
Splitting or parting of a double-width brake drum shell requires tools first to machine the steel shell, then the weld or bond and finally the cast alloy iron. In this machine the work-holding device on the loading

turret revolves with the spindle, gripping the part lightly on the inside by spring-loaded jaws. Two tools are mounted in the rear slide and two tools in the front slide. The rear slide is set $\frac{1}{2}$ of the feed per revolution in advance of the front slide.

Spray-Finishing Machine, Generator, Automatic

DeVilbiss Co., Toledo, Ohio. [Vol.76,p.538.] 91.

Automatic spray equipment is



here applied to a generator finishing machine which requires no operator. A variety of similar specialized set-ups have been constructed.

Tumblers, Tilting, Bench-Type

Baird Machine Co., Bridgeport, Conn. [Vol.76,p.217.] 68.

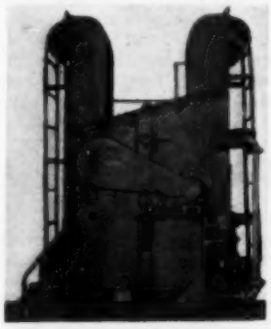
Small quantities of work can be tumbled in these belt- or motor-driven oblique tilting tumblers arranged for bench mounting. Barrels can be furnished of different materials, shapes

and sizes to suit work. The barrel can rotate in any one of eight angles from a vertical position to 20 deg. below horizontal.

Washing Machine, Solvent, Vertical

Rex Products & Mfg. Co., 13005 Hillview Ave., Detroit, Mich. [Vol.76,p.220.] 76.

For use where floor space is limited, this vertical solvent washing machine may be operated by one person. Work is placed on a conveyor, with or without fixtures, then passes

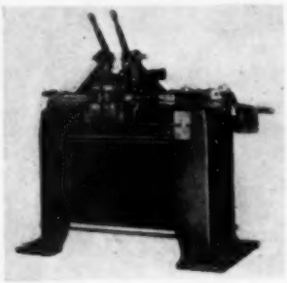


downward between streams of boiling solvent. Work and conveyor then pass upward to drain. After a rinse of distilled, hot solvent, work passes upward and leaves the machine dry.

Welding Machine, Butt, Type B

Lenney Machine & Mfg. Co., Warren, Ohio. [Vol.76,p.411.]

This butt welder of light and medium capacity for production work has a die opening of 2 in. and total adjustment between dies of 3½ in. Current regulation is in 12 steps. It operates



on single-phase current of any voltage or frequency. It is regularly furnished for 220 or 440 volts, 60 cycles. Capacities range from 25 to 100 kva.

Welding Machine, Spot

Eisler Electric Corp., 740-772 So. 13th St., Newark, N. J. [Vol.76,p.30.] 5.

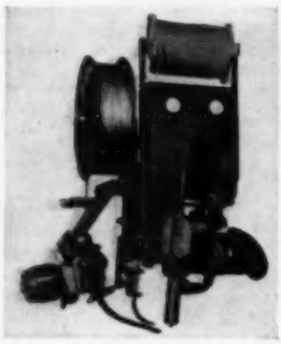
Series MW spot welders are equipped with a variable-speed reduction, geared-head motor enabling the operator to make 30 to 100 welds per min. in graduated steps. A variable-current regulator controls the heat of the weld, while the pres-

sure is adjusted by a nut. Timing is automatic. Six sizes of machines are ½, 1, 3, 5, 10, 20 and 35 kva. and will weld from 0.0005 to ⅜ in. combined thickness.

Welding Head, Wire-Feeding

Lincoln Electric Co., Cleveland, Ohio. [Vol.76,p.414.]

This wire feeding head al-



lows automatic arc welding with the shielded arc process. Means are provided for varying the speed of travel of the head. Continuous filler metal is obtained from a reel mounted on the head and is usually in strip form, ⅛ in. wide by 1/32 in. thick. It is furnished in 70-lb. coils. The filler strip does not pass through the arc as in metallic welding, but beneath it, and is therefore not subject to high temperatures.

Welding Control, Tube Timer

Cutler-Hammer, Inc., 296 N. 12th St., Milwaukee, Wis. [Vol. 76,p.313.] 116.

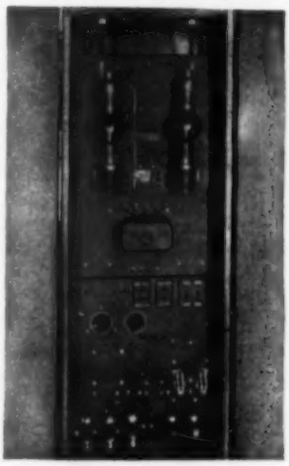
This timing device for spot, projection and other forms of resistance welders makes possible accurate timing control

through an electronic tube. Adjustment ranges from a fraction of a second to 16 sec. The device is operated on 110 to 550 volts a.c., 25 to 60 cycles.

Welding Control, Tube-Timing, "Thyratron"

General Electric Co., Schenectady, N. Y. [Vol.76,p.443.]

Close and accurate control of the frequency of current interruption in line welding, and an increase in speed of interruptions up to 1,800 per min., are found in the "Thyratron" tube timing control. The weld is al-



ways started at a predetermined point in the voltage wave and stopped when the current passes through zero. Thus, the period of current application can be accurately controlled even with "on" times of but one or two cycles. The synchronous tube timer supplements, and is designed to work in conjunction with, the welding control Type CR-7503 (Vol. 74, p. 845).

Portable Tools

Drills, Electric, ¼ and ½-In.

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.76,p.653.] 256.

Aluminum and ball-bearing construction is used in these two electric drills, a ¼-in. size with grip switch, known as the USA, and a ½-in. size with side switch,

designated as URA. The USA has a speed of 2,500 r.p.m. and weighs 8 lb., while the URA runs at 500 r.p.m. and weighs 14½ lb.

Drill, ¼-In.

U. S. Electrical Tool Co., 2499 W. Sixth St., Cincinnati, Ohio. [Vol.76,p.775.] 309.

This ¼-in. "Midget" electric drill weighs 3½ lb. and is only 8 in. long. Body is of aluminum and gears of the double-reduction type.

Drills, Pneumatic, "Power Vane"

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol.76,p.717.] 289.

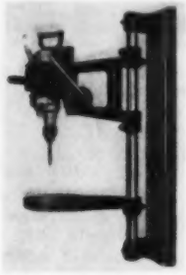
The unit is claimed to have the same power in both forward and reverse. The drill is balanced. A replaceable hardened steel cylinder liner is used.

Reversible and non-reversible units are available in sizes with drill capacities from ½ to ¾ in.; chuck from ¼ to 2 M.T., and light speeds from 1,200 to 350 r.p.m.

Drillstand, Portable

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.76,p.411.]

This post-type radial drillstand with a sensitive rack and pinion feed adjustment is for use with all Hisey portable electric drills up to and includng ¾-in. capacity. Motor-holding



brackets are designed so that the portable drill can be attached without removing a single part. Vertical adjustment (without resetting) by means of rack and pinion is 7½ in.

Grinder, Air, Model DD

Madison-Kipp Corp., Madison, Wis. [Vol.76,p.186.] 58.

This larger Model DD one-hand grinder will take grinding wheels up to 1½ in. in diameter and operates at a speed of 30,000 r.p.m. It is intended for

larger work in general toolroom service. Length is 9¾ in.; weight, 2½ lb. The speed control automatically maintains the speed through air pressures of 50 to 120 lb. per sq.in. Special Kipp wheels are used with this grinder.

Grinder, Pneumatic, No. 255X

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.76,p.348.] 114.

The "Thor" No. 255X rotary pneumatic grinder operates cone-shaped grinding wheels for cleaning castings and grinding castings and forgings where the

use of the ordinary emery wheel is not practical. Speed is 10,000 r.p.m., and the machine will take cone wheels measuring 2¾ in. outside. Weight of the machine is 8¾ lb., and the length over-all is 19¼ in.

Grinder, Pneumatic, No. 66

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol.76,p.538.] 178.

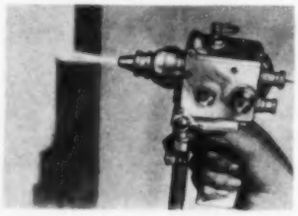
This rotary pneumatic rod grinder grinds and smooths any wide surface. Features include governor control and removable

air strainer. The machine takes a 2½ x 6 x ¾-in. wheel, is 27½ in. long over-all, has a light speed of 5,800 r.p.m., and a net weight complete of 15½ lb.

Gun, Metal-Spraying

Metallizing Co. of Los Angeles, Ltd., 1218 Long Beach Ave., Los Angeles, Calif. [Vol. 76,p.656.] 12.

This electric unit is capable of spraying zinc, nickel, lead, bronze, copper, Monel metal, aluminum, brass or tin from the

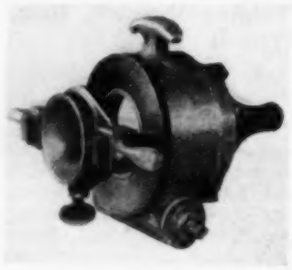


wire of these metals. The gun makes a molten spray of metal from wire, fed to it from a spool.

Power Adapter, No. 17

Borden Co., Warren, Ohio. [Vol.76,p.775.] 301.

This power adapter, or worm-driven die stock, uses inter-



changeable die heads to thread from ⅛ to 2-in. pipe and may be operated by means of a ¾-in. heavy-duty electric drill. It is of aluminum-alloy construction and weighs 17½ lb. The double-ended drive permits cutting both right- and left-hand threads.

Sander-Grinder, Disk, Type E-7

Portable-Cable-Hutchinson-Corp., Syracuse, N. Y. [Vol. 76,p.312.] 82.

This portable disk sander-grinder with a built-in vacuum system for picking up the dust has a 7-in. abrasive disk which

travels at 3,200 r.p.m. A rubber pad gives a flexible backing to the disk. Height over-all of the tool is 12 in., and weight is 21 lb.

Sander, Electric, Portable

Stanley Electric Tool Co., New Britain, Conn. [Vol.76,p. 413.] 132.

The tool housing is of aluminum alloy. Seal-type bearings are used on the armature and spindle. The 9-in. disk is flexible to assure smooth work. An auxiliary handle is provided. The tool is powered by a uni-

versal motor and is made for 110, 150, 220 and 250 volts.

Screw Driver, Electric

Stanley Electric Tool Co., New Britain, Conn. [Vol.76,p. 685.] 268.

Type No. 31 drives No. 12-2 in. screws in hardwood; No. 32, No. 16-3¼ in. screws. No. 31 measures 14⅜ in., weighs 8 lb.

With socket wrenches the No. 32 will run on nuts up to ⅜ in. It is 15¾ in. long, weighs 9 lb.

Tools, Portable, Electric

Stevens Walden, Inc., Worcester, Mass. [Vol.76,p.31.] 11.

Portable electric drills, polishers, sanders, valve refacers and bench grinders have been announced. The drills are available in seven models—three ¼-in. ball-bearing designs, two ½-in. Timken bearing designs,

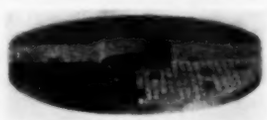
and in ⅜ in. heavy-duty and ¾ in. heavy-duty sizes equipped with Timken thrust bearings. Portable polishing machines are made in 5, 7, and 9-in. sizes and electric sanders are made in 7 and 9-in. sizes. The bench grinder is made in a 6-in. type.

Small Tools

Abrasive Disk, Improved, "Wire Lokt"

Gardner Machine Co., Beloit, Wis. [Vol.76,p.229.] 64.

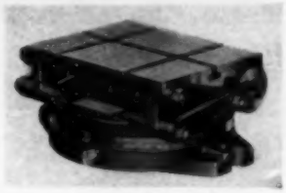
"Wire Lokt" abrasive disks eliminate any cement set-up in the user's plant: there is no backing to be returned for resurfacing, and attachment of the wheel to the steel disk wheel is made simply by fillisterhead screws. The disks are normally built with 1 in. of usable abrasive. These disks are supplied in all standard diameters, and with standard center holes only.



Angle Plate, Adjustable

Taft-Peirce Mfg. Co., Woonsocket, R. I. [Vol.76,p.66.] 17.

This fixture consists of a tilting table 8x10 in., hinged at one edge to a base, which is rotatable on a graduated sub-base

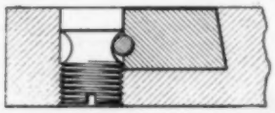


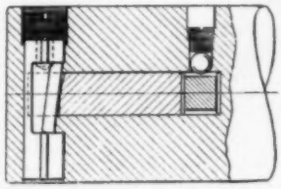
fitted with holding lugs and a bottom key for securing to the machine table. Approximate weight of the device is 75 lb.

Boring Bars, Block-Type

McCrosky Tool Corp., Meadville, Pa. [Vol.76,p.802.] 324.

A key in the bar has a tapered V that locates and locks the block by engaging a V in the front of the block. By adjusting the position of this key in





the bar, the block can be either locked rigid or made to float by any desired amount. Total range of bores handled by all sizes of blocks in the five series is 1¼ to 12 in.

Broach, "Rotor-Kut"

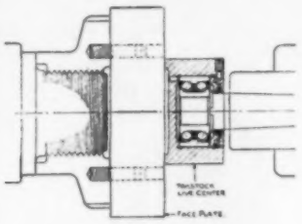
LaPointe Machine Tool Co., Hudson, Mass. [Vol.76,p.655.] 255.

Taking both roughing and finishing cuts, this "Rotor-Kut" tool has polyangular cutting or broaching sections. It will finish-broach forged, pierced, or cored holes from the rough without preliminary boring or reaming. Cutting portions in each series are out of axial alignment with each other, but are evenly spaced about the periphery.

Center, Ball Bearing, "Red-E"

Ready Tool Co., Bridgeport, Conn. [Vol.76,p.410.] 149.

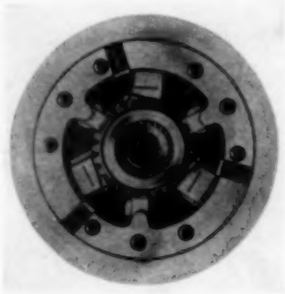
This special ball-bearing center holds work up to the faceplate where such work cannot be held on an arbor for turning the outside diameter or periphery. This center has a special head large in diameter and relieved except for a circle of about ⅜-in. face.



Chuck, Grinding and Boring, Gear

City Machine & Tool Works, East Third at June St., Dayton, Ohio. [Vol.76,p.539.] 203.

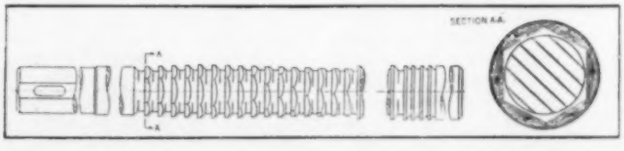
This grinding and boring chuck, although designed principally for helical gears, may also be used for spur gears. This automatic method is claimed to avoid previous difficulties in chucking narrow-faced helical gears.



C-Clamp and Drill Press Vise, "Flash"

Climax Equipment Co., 5514 W. Lake St., Chicago, Ill. [Vol. 76,p.444.] 159.

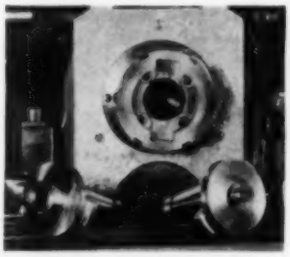
This quick-acting square C-clamp may also be used as a drill press vise. The upper jaw is slidably mounted. With the material between the jaws, a locking movement binds the upper jaw to the upright, and forces an auxiliary jaw out to take up all play and hold the material rigidly. Standard sizes are 6, 12 and 18 in.



Collets and Shell End Mill Arbors

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol.76, p.571.] 219.

With an adapter mounted on the nose of any milling machine having a 5$\frac{1}{16}$ in. diam. standard spindle nose with the national standard taper hole (3½ in. taper per ft.), these quick-change collets and quick-change shell end



mill arbors reduce cutter changing time to ½ min. One-fourth turn of the ring nut clockwise locks the collet. Arbors are available for shell end mills having national standard diameters of: 1½ to 6 in. Collets are offered with No. 7, 9, 10 and 11 B. & S., No. 2, 3, and 4 Morse tapers, either plain or tang drive.

Cutters, Milling, Face, Cone-Type

McCrosky Tool Corp., Meadville, Pa. [Vol.76,p.154.] 42.

The serrated blades are locked in the body by a hardened lifting wedge brought into contact with the blade by a hollow headless setscrew. Behind each

blade is another. Standard blades are made of high-speed steel, but can be furnished in Stellite or tipped with cemented carbide. Standard sizes range from 5 to 20 in.

Cutters, Milling, Stellite,

O. K. Tool Co., Shelton, Conn. [Vol.76,p.219] 72.

Milling cutters with either Stellite or Stellite J-Metal blades are now available with the essential features of the O. K. serrated cutter blade. The blade is backed by an adjustable wedge interlocking with

it by mating grooves and positively locking in the body. By changing the position of the grooves of the wedge and blade, the blade may be adjusted either axially or radially, or both.

Cutter, Milling, Side or Straddle

Lovejoy Tool Co., Inc., Springfield, Vt. [Vol.76,p.601.]

For use where side space is limited, and available either right- or left-hand, this side milling cutter embodies the company's original positively locked

blade, and has a blade adjustment of approximately one-half the total length to compensate for wear and grinding. Blades may be of standard or cobalt high-speed steel, Stellite, Stellite J-Metal, or tungsten-carbide.

End Mills, Hollow-Ground

Weldon Tool Co., 1426 West Third St., Cleveland, Ohio. [Vol.76,p.475.] 172.

These double-ended end mills with hollow-ground lips provide easy reversal by using a straight shank which is a close

sliding fit in the toolholder and is held in place by a setscrew in the holder locking on the flat in the center of the mill shank. Mills are available with left- or right-hand cut and left- or right-hand spiral.

Hollow Mills, Types H and J

Gairing Tool Co., Detroit, Mich. [Vol.76,p.627.] 227.

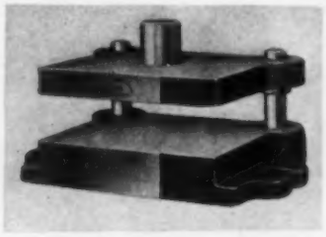
Type H adjustable-blade hollow mills are for heavy production and Type J for light roughing and finishing cuts.

Adjustments on Type H are made by rotating the cone-shaped external nut; on the Type J by unlocking and turning a thrust collar. Bodies are of alloy steel. High-speed steel, Stellite, or tungsten-carbide blades may be used.

Die Sets, Commercial

Danly Machine Specialties Inc., 2112 S. 52nd Ave., Chicago, Ill. [Vol.76,p.538.] 192.

These sets are designed and intended to handle economically requirements of from 300 to 300,000 pieces. Shoes and sizes are identical with those of Danly precision die sets, the change being only in guide posts and bushings. Guide posts

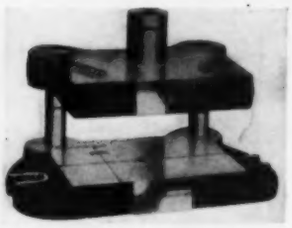


are of hardened manganese steel and bushings of special nickel alloy to prevent binding and to minimize wear. Commercial sets can be converted to the precision sets by changing pins and bushings.

Die Sets, Drop Forged

E. A. Baumbach Mfg. Co., 1812-1818 S. Kilbourn Ave., Chicago, Ill. [Vol.76,p.744] 295.

These die sets have the die shoes and punch holders drop-forged from 35-40 carbon steel completely normalized. Work-

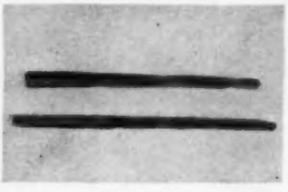


ing surfaces are machined and ground. The punch holders are fitted with bushings made of high-manganese steel.

Drills, Taper-Reamer, "Brocho"

A. C. Bellefleur & Sons Co., 136 Garfield Ave., New London, Conn. [Vol.76,p.285.] 15a.

"Brocho" taper reamer drills both drill and ream all standard taper and Morse taper holes in

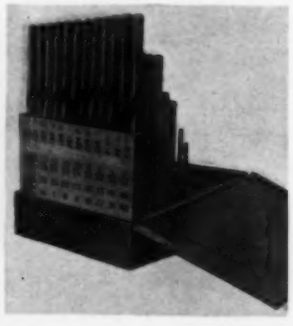


one operation. In addition, they can be made to any taper and size desired from sketches. Sheffield high-speed steel is used.

Drill Set

Huot Manufacturing Co., St. Paul, Minn. [Vol.76,p.183.] 1.

This drill stand and container with tap information on the face consists of a box of cadmium-plated steel, and the panels of drills fold into it like the



pages of a book. The drill index is made in three sizes: No. 29 for fractional drills from $\frac{1}{16}$ to $\frac{1}{2}$ in. by 64ths; No. 60 for wire gage sizes from Nos. 1 to 60; and No. 13 for fractional drills from $\frac{1}{16}$ to $\frac{1}{4}$ in. by 64ths.

Drill Sets

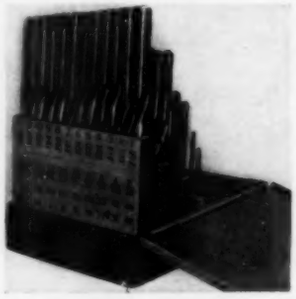
Cleveland Twist Drill Co., 1242 East 49th St., Cleveland, Ohio. [Vol.76,p.599.] 173.

Four drill sets in metal cases, two carbon and high-speed steel fractional-size drills, the other two carbon and high-speed steel wire-gage size drills, are available. Fractional-size sets have drills in all jobbers' sizes from $\frac{1}{16}$ to $\frac{1}{2}$ in. by sixty-fourths, the wire-gage sizes from No. 1 to No. 60, all straight-shank sizes.

Drill Sets

Union Twist Drill Co., Athol, Mass. [Vol.76,p.710.] 269.

Two drill sets are available in Huot index containers. Index set No. 118 carries carbon steel drills from $\frac{1}{16}$ to $\frac{1}{2}$ in. by $\frac{1}{64}$ in.

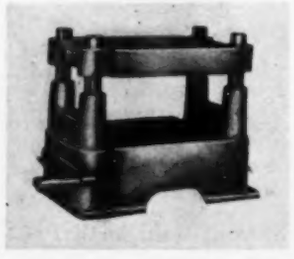


in jobber lengths. Index set No. 119 carries carbon steel drills, wire gage, No. 1 to No. 60. High-speed drills can be furnished.

Drill Fixtures, 2-Post and 4-Post

Modern Engineering Service, 7 E. Grand Ave., Detroit, Mich. [Vol.76,p.509.] 177.

Guide pins are positioned by setscrews in the top platen instead of the lower. The clamping mechanism consists of two eccentric gears, one mounted on

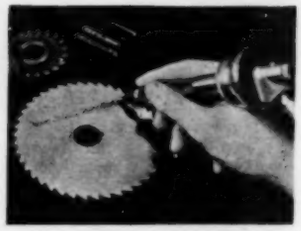


the clamping handle, the other meshing with it and mounted so that it depresses curved flat springs whose ends are fastened to the bottom of the guide pin. Thus the two eccentric gears raise and lower the bushing plate which clamps the work.

Engraving Tool, "Steel Writer"

Madison-Kipp Corp., Madison, Wis. [Vol.76,p.414.] 144.

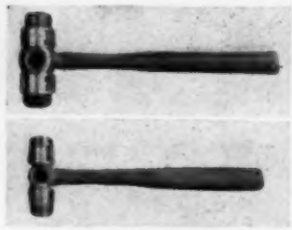
The "Kipp Steel Writer" writes on steel or glass almost as fast as it is possible to write on paper and can be used with Kipp Models AG or BB air grinders. A new assortment of air tool accessories is also available, known as Craftsmen's Choice No. 1.



Hammers, Soft Faced, "Red-Spot"

Lapeer Engineering & Mfg. Co., Lapeer, Mich. [Vol.76, p.626.] 229.

Annealed copper, bronze, brass, aluminum, babbitt, rawhide, fiber or wood soft faces mounted in double-faced or uni-



versal hammers are now available. The universal hammers have one steel face with rounded edges.

Punches and Retainer Blocks

Surlock Punch Co., 38 Piquette Ave., Detroit, Mich. [Vol.76,p.151.] 22.

Quick replacement features this line of punches and retainer blocks. The punch has a long keyway which engages with a feather in the retainer block. If the punch is irregularly shaped it can only be inserted

in the correct radial position. At the top end the punch is threaded and engages with a nut that has gear teeth cut around its periphery. Small hollow-head screw in the wrench hole holds the retainer nut against vibration in heavy punching. Special retainer blocks may be of any desired thickness or punches may be placed at different levels.

Reamer, Expansion, Solid Shank

O. K. Tool Co., Shelton, Conn. [Vol.76,p.286.] 70.

This adjustable sizing reamer for finishing operations combines high-speed steel cutter blades with a drop-forged, chrome-nickel steel body. Blades are locked by a conical wedging screw, spreading the split body against the blade. Blades

are set at negative spiral and are irregularly spaced for fine finishing work.

Screw Plates

Wells Tool Co., Greenfield, Mass. [Vol.76,p.445.] 155.

In this line of screw-cutting tools, comprising stocks, dies, taps and screw plates, the lands or teeth of the die project below the body, which gives free

disposal of chips. The die is adjusted by a taper adjusting screw. Stocks have adjustable guides and are of one-piece malleable iron. Die sizes range from ¼ to ¾ in.; pipe dies from ¼ to ⅜ in.

Toolbits, Square

O. K. Tool Co., Shelton, Conn. [Vol.76,p.221.] 71.

These square toolbits are ground to size, will fit any make of square-bit toolholders and may be used in the toolholders of turret lathes. The tool bits are drop-forged.

Toolbits, "Armide"

Armstrong Bros. Tool Co., 317-357 N. Francisco Ave., Chicago, Ill. [Vol.76,p.412.] 128.

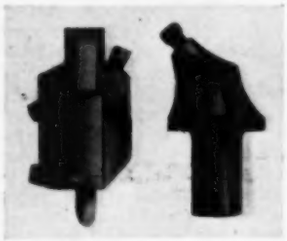
A new type of cutting carbide, said to be an alloy, is used in these "Armide" toolbits. This carbide has a hardness of from 88.5 to 90.5 Rockwell C scale and a tensile strength of 250,000 lb. per sq.in. Thermal conductivity is low. Edges are claimed not to groove. Bits are made

in two types and in five ready-ground cutter forms. All forms are available in either flat or square bodies. The squares are made in ¼ to ⅜ in. and the flats in ¼ x ⅜ to ⅜ x ⅝ in.

Tool Bit Holders

Four Grip Tool Co., 107 East Seventeenth St., Paterson, N. J. [Vol.76,p.508.] 169.

An angular clamping arrangement that clamps the tool bit in the V formed by the two opposite sides is the feature of the "Four-Grip" line of tool-bit holders. The combination planer

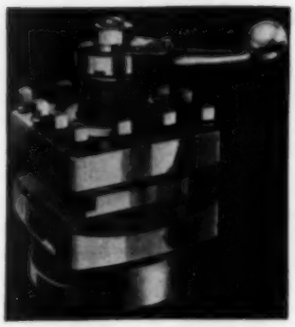


type (illustrated) has two parts, the shank containing an octagonal socket, which may be permanently clamped to the rail-head, and the head, which has an octagonal shank and is movable.

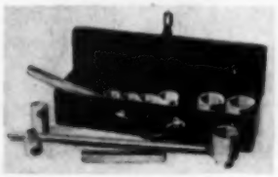
Toolposts, Turret

McCrosky Tool Corp., Meadville, Pa. [Vol.76,p.716.] 290.

In the new design a hardened steel sleeve with 12 vertical grooves in exact axial relation to the 12 indexing positions has been added to the stem of the turret column. The ratchet ef-



fect produced by these parts aids in rapid indexing. Turrets are made in three 4-way styles and two hexagon styles.



Wrenches, Socket, Extra Heavy Duty

Bonney Forge & Tool Works, Allentown, Pa. [Vol.76,p.413.]

This series of extra heavy duty socket wrenches consists of 14 hexagon sockets with openings from 1 1/16 to 2⅛ in. The line also includes extensions 9 in. and 18 in. long, a 22-in. sliding bar and male and female drive heads. The No. XH set consists of seven hexagon sockets with openings of 1 1/16 to 2⅛ in., a 9-in. extension, an 18-in. extension, and a 22-in. sliding bar.

Gaging, Measuring and Testing Equipment

Comparator, External, "Electrolimit"

Pratt & Whitney Co., Hartford, Conn. [Vol.76,p.151.] 54.

The "Electrolimit" external comparator provides fast and accurate means for inspection of production work, particularly in selective inspection. Maximum distance between anvil and spindle is 4 in. The anvil has a serrated surface 1½ x 3½ in. The anvil can be removed easily, and on the reverse side is a V-block. This equipment can be plugged into a 110-volt, 60-cycle line. Standard magnification of the circuit will cause the needle to travel about 1/16 in. for each 0.001 in. variation in size.

Comparators and the "Acro-Lite"

Standard Gage Co., Poughkeepsie, N. Y. [Vol.76,p.149.]

The No. 119 comparator is intended for production checking of flat and cylindrical work and also for inspection of gages and tools. The lapped, serrated surface table slides in V-ways to offer new surfaces in case wear develops in a localized area. Range of this instrument is 0 to 1⅛ in. It can be fitted with a dial indicator reading to 0.0001 in. or with the Acro-Lite. A range of 0 to 6 in. is afforded by the Model 105 comparator, suitable for toolroom and gage inspection, as well as production inspection of large work.

The "Acro-Lite" is a mechanical projection instrument. When equipped with this device,

the comparators are universally applicable to checking master gages and tools by using removable scales having divisions of 1/100,000 in. or 1/500,000 in., and, on the other hand, for production inspection with a scale having divisions of 1/10,000 in.

Micrometer Calipers with T. C. Surfaces

L. S. Starrett Co., Athol, Mass. [Vol.76,p.150.] 37.

The anvil and spindle of micrometers are now available with facings of cemented tungsten carbide to give greater wear resistance. The frame is cut away to facilitate use in places where the ordinary micrometer cannot be inserted.

Micrometer Calipers with T. C. Surfaces

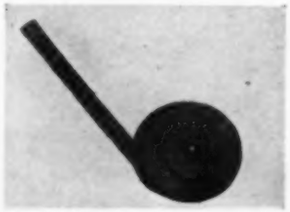
Brown & Sharpe Mfg. Co., Providence, R. I. [Vol.76.p. 800.] 320.

Micrometer calipers (1-in. size) in several styles have the ends of the spindle and anvil faced with tungsten carbide, useful where the micrometers are subjected to unusual wear.

Rule, Tape, "Crescent Junior"

Lufkin Rule Co., Saginaw, Mich. [Vol.76,p.285.] 102.

This smaller tape rule is automatic in winding and is made in two lengths, 4 and 6 ft. The blade is 1/16 in. wide and can be



projected unsupported to walls or into openings like a rule. Inches are graduated to 16ths. The case is chromium-plated.

Rules, Flexible, Steel

Stanley Rule & Level Plant, New Britain, Conn. [Vol.76, p.656.] 249.

These pull-push rules with a 6-ft. steel blade, coiled in a watch-size steel case, are gradu-

ated in sixteenths. The rule is a concave steel strip that may be bent as desired and yet is ordinarily rigid.

Testing Equipment, Brinell

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol. 76,p.27.] 2.

This portable Brinell hardness testing instrument consists of a heavy piece of steel about 7¼ in. long, ¾ in. thick, 1⅝ in. wide at one end and tapering to a width of ⅞ in. at the other

end. In making a test the instrument is held in the drill press or between the jaws of the vise or C-clamp with the ball point against the piece to be tested. The box contains a standard test piece of steel. The whole outfit weighs 3 lb. 9 oz.

Testing Equipment, Brinell

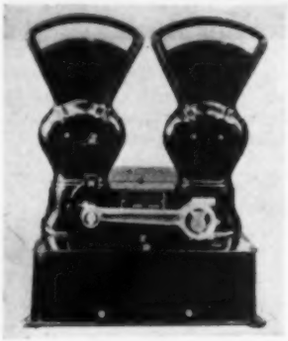
Poldi Steel Corporation, 245-247 West 18th St., New York, N. Y. [Vol.76,p.652.] 230.

The apparatus with a standard steel bar in place is put over a smooth spot on the material to be tested and is struck a light blow. The indentation in the standard steel bar and the indentation in the material are then compared by magnifying glass.

Testing Machines, Connecting-Rod

Toledo Precision Devices, Inc., subsidiary of Toledo Scale Co., Toledo, Ohio. [Vol.76,p. 220.] 33.

This connecting-rod testing "Auto-Gage," consists of two separate machines. One weighs both ends of the connecting rod at the same time. Charts regis-



ter the amount of overweight in each end. The operator sets the dials of the shaving machine to coincide with the figures on the charts.

Testing Machine, Gear, Zeiss

George Sherr Co., Inc., 128 Lafayette St., New York, N. Y. [Vol.76,p.218.] 75.

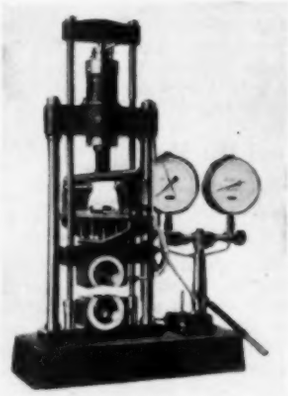
Measuring precision to 0.0001 in. combined with rapid operation are features of this instrument. The gear tester will take spur, bevel, helical, and worm

gears and test the following elements: circular pitch, eccentricity, uniformity of tooth spaces, and uniformity of tooth thickness. The gear is placed between centers, where it can be revolved to bring successive teeth into position.

Testing Machine, Universal Hydraulic, Type MP-10

Steel City Testing Laboratory, 8843 Livernois Ave., Detroit, Mich. [Vol.76,p.559.] 221.

For testing specimens in tension, transverse bending and compression, this moderately priced testing machine is designed for use in foundries, sheet metal, wire, cable, and

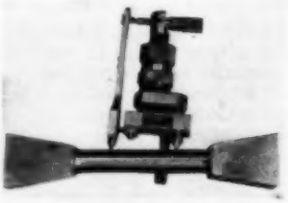


welding plants, where a machine of low capacity (22,000 lb.) will suffice. Accuracy of load indication is ± 1 per cent. Distance between clamping heads is 16½ in.; between pressure plates, 13¾ in. Piston stroke is 4¾ in., and the width between tie-rods of the upper clamping head 8¾ in.; over-all height, 54⅜ in.

Extensometer, "Oxweld"

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.719.] 283.

This extensometer determines the yield point of specimens being tested in tensile testing machines. Elongation between

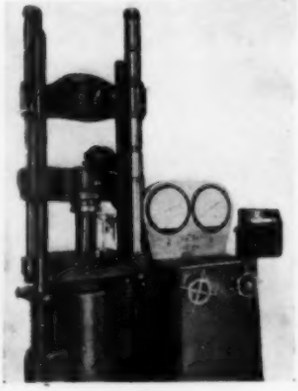


the two points during tension is multiplied in a ratio of 5-to-1 by a lever bar making electrical contact with the micrometer head. The instrument may also be used as a strain gage.

Recorder, Stress-Strain

Baldwin - Southwark Corp., Philadelphia, Pa. [Vol.76,p. 772.] 307.

This autographic recorder is electrically operated and inte-

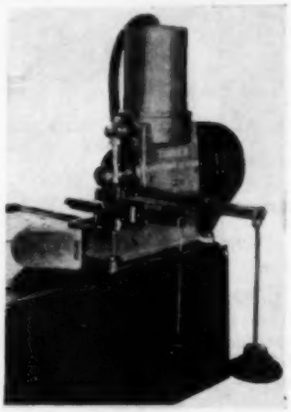


grates the two test values to give an exact account of conditions during the test. No gage marks for mounting the instrument on the test specimen are required.

Testing Machine, Wear and Lubricant

Timken Roller Bearing Co., Canton, Ohio. [Vol.76,p.600.]

Accurate information on the load-carrying capacity of lubricants, measurement of friction, and wear characteristics of any



kind of material can be obtained on this simple machine. Over-all base dimensions are 8½ in. wide, 13½ in. long, and height is 22 in. Weight installed is 135 lb.

Dynamometer, Scale-Type

Toledo Precision Devices, Inc., Toledo, Ohio. [Vol.76, p.475.] 167.

This torque dynamometer scale registers the stalling torque of motors. Its cycle of operation takes approximately 15 sec. The dynamometer is

designed for mounting on a bench. The shaft of the motor is placed in alignment with a horizontal arm.

Microscope, Type BKT

Bausch & Lomb Optical Co., Rochester, N. Y. [Vol.76,p. 251.] 80.

This Type BKT microscope is similar to other wide-field

binocular microscopes manufactured by the company, but is mounted on a laboratory stand with substage mirror, which greatly broadens the range of its application. The stage is of glass, and thus either opaque or transparent specimens can be observed. The microscope is removable from the base, and can be placed on objects too large for the stage to accommodate. Five pairs of objectives give a range of magnification from 0.7 to 87 times.

Spectroscope, "Spekker Steeloscope," Shop

Riehle Bros. Testing Machine Co., 1424 North 9th St., Philadelphia, Pa. [Vol.76,p. 187.] 20.

The "Spekker Steeloscope" is a specialized spectroscope for rapid estimation of metallic elements in steels. The Steeloscope has but one adjustment, observation of the various

metals being provided for by an eyepiece which can be moved to definite positions indicated by engraved chemical symbols. At each position can be seen the most distinctive spectrum lines of the metal whose symbol is inscribed.

Tachometer, Hand

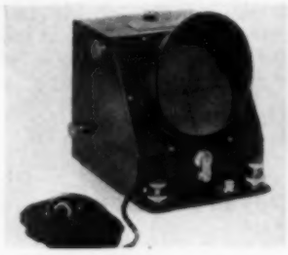
Amthor Testing Instrument Co., 309 Johnson St., Brooklyn, N. Y. [Vol.76,p.684.] 277.

The speed reading is automatically fixed on the dial after each time the Type 350 hand tachometer is used. Various ranges can be had to measure speeds up to 12,000 r.p.m.

Vibrometer, Model S-2, Davey

Electrocon Corp., 6 Varick St., New York, N. Y. [Vol.76, p.601.] 220.

Capable of measuring vertical and horizontal vibration simultaneously, this Model S-2 vibrometer is simply set upon the object whose vibrations are to be measured. A spot of light



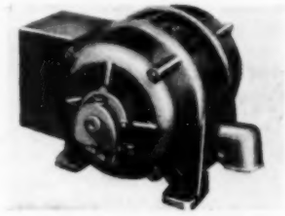
traces out the exact path of the vibration, magnified on a ground glass scale. The unit will measure frequency and phase position in addition to amplitude if used in conjunction with Davey portable balancing equipment. The instrument will indicate accurately amplitudes of vibrations of frequencies above 400 per minute up to approximately 6,000 per minute.

Electrical Equipment

Motor, Capacitor

The Ideal Electric & Mfg. Co., Mansfield, Ohio. [Vol.76, p.509.] 181.

Improved starting and running characteristics are claimed in this "Noel" polyphase capacitor motor. The condenser

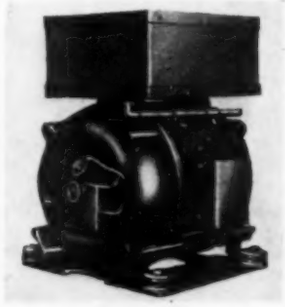


reactive current is caused to flow through the windings and thereby produces a high power factor within the motor itself.

Motors, Capacitor

Century Electric Co., St. Louis, Mo. [Vol.76,p.653.] 238.

Capacitor motors in sizes from 1/8 to 10 hp. are furnished for single or multispeed operation with normal, high or low



torque characteristics. Small sizes have the capacitor box mounted above the motor. Larger sizes have a seperate capacitor box.

Motors, Capacitor

Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo. [Vol.76,p.776.] 300.

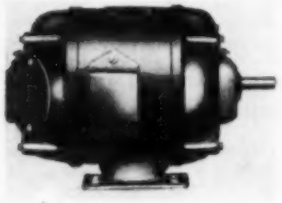
Type RZH condenser-start, condenser-run, split-phase motors vary condenser capacity from start to run by means of a

switch and auto-transformer. These motors are available as rigid-mounted or rubber-mounted types.

Motors, Induction, Single-Phase

Century Electric Co., St. Louis, Mo. [Vol.76,p.572.] 187.

This line of brush-riding, single-phase, repulsion-start induction motors is intended primarily for those applications where quiet operation or higher operating characteristics are not



required. It does not replace Century brush-lifting motors for long-hour-per-year applications.

Motor, Repulsion-Induction Type RG

Wagner Electric Corp., 6400 Plymouth Ave., St. Louis, Mo. [Vol.76,p.476.] 179.

Type RG repulsion-induction motor has a smooth speed-torque curve throughout the operating range and possesses the following features: low starting current, close speed regulation,

positive operation on low voltage, high power factor, good commutation, and no internal short-circuiting or brush-lifting mechanism. Bolt holes permit 90 and 180 deg. rotation of endplates.

Motors, Split-Phase, Types 44RB and 56RB

Wagner Electric Corp., 6444 Plymouth Ave., St. Louis, Mo. [Vol.76,p.627.] 225.

Drip-proof endplates, wool-yarn lubrication, handy conduit box adjustable in four positions, and quiet, vibrationless, and cool operation are claimed as fea-

tures of these redesigned split-phase motors. The 44RB is available in 1/30 and 1/20 hp., and the 56RB in 1/8, 1/6, and 1/4 hp., 1,725 and 1,140 r.p.m., all cycles.

Motor, Type N-3

Bodine Electric Co., 2264 W. Ohio St., Chicago, Ill. [Vol.76, p.629.] 244.

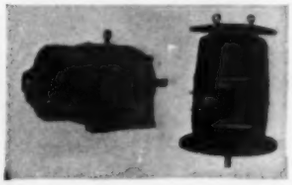
Rated at 1/20 and 1/15 hp. at

1,725 and 3,400 r.p.m., this small motor with wool-packed bearings is designated as Type N-3. It is rated at 1/30 and 1/20 hp. at 1,125 r.p.m. Synchronous and split-phase induction motors and series and shunt d.c. motors are available in the same frame. A simplified automatic cutout is incorporated.

Motors, Vertical and Slip-Ring, D.C.

Century Electric Co., St. Louis, Mo. [Vol.76,p.347.] 126.

The Type R d.c. motor for vertical operation is ball-bearing equipped, grease-lubricated and mounted on a ring base or directly on the driven equip-

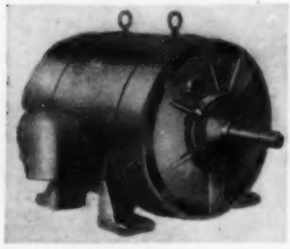


ment. Sizes are from 1 to 150 hp. The line of slip-ring motors has been extended from 20 to 250 hp., 1,800 r.p.m., 60 cycles. The complete line now is ¼ to 250 hp.

Motors, Reversing, A.C.

Reliance Electric & Engineering Co., 1042-1090 Ivanhoe Rd., Cleveland, Ohio. [Vol.76, p.775.] 305.

These inclosed, fan-cooled motors are designed with torque characteristics to reverse 40 times per minute. Cartridge-type ball bearings are furnished.



Motors, Punch Press

Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, Ohio. [Vol.76,p.313.]

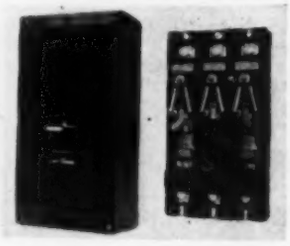
This line of induction motors is especially adapted for punch presses. Motors range in size from ½ to 200 hp. The frame

is fabrciated from bar steel, electrically welded. Open, fully inclosed or fully-inclosed, fan-cooled types are available.

Circuit Breakers, "De-ion," Type AB

Westinghouse Elec. & Mfg. Co., East Pittsburgh, Pa. [Vol. 76,p.444.] 162.

For motor circuits and general light and power distribution, this Type AB "De-ion" circuit breaker replaces fused knife switches, safety switches and carbon breakers. The breaker has nothing to be replaced or renewed. It cannot be held

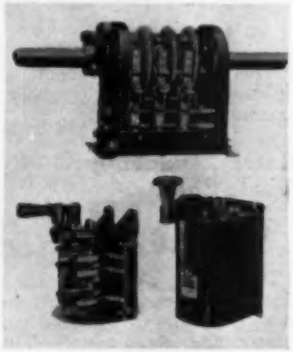


closed against an abnormal overload or short circuit, nor can it be blocked to prevent opening the circuit. Its rating cannot be changed by unauthorized persons. The 15- to 50-amp. breakers will be available in 1-, 2-, and 3-pole combinations, 125 and 250 volts. The 55- to 600-amp. breakers will be available in 2- and 3-pole combinations up to 575 volts.

Controllers, Drum

Cutler-Hammer, Inc., 205 N. 12th St., Milwaukee, Wis. [Vol. 76,p.253.] 87.

This line of a.c. and d.c., across-the-line type, reversing drum controllers is made in two- or three-pole types; with radial or rope lever operating



mechanism; self-centering or non-self-centering mechanism, and with or without either main-line, limit-switch protection or pilot-circuit interlocks.

Station, Pushbutton, Pendant-Type

General Electric Co., Schenectady, N. Y. [Vol.76,p.184.]

Pendant-type, momentary-contact pushbutton stations, designated as Type CR-2940, are particularly designed for control of motors driving machine tools.

Stations, Pushbutton, Unit-Type

General Electric Co., Schenectady, N. Y. [Vol.76,p.281.]

Type CR-2940 pushbutton stations for general industrial applications are divided into three general classes: those which make momentary contact; those which maintain the contact, and a combination. The device consists of one or more of the following units inclosed in a case: pushbut-

ton; selector switch, and indicating-lamp receptacle. Any combination not exceeding five of these units is available in the wall-mounted stations.

Stations, Pushbutton, Type A-31

Lincoln Electric Co., Coit Rd. & Kirby Ave., Cleveland, Ohio. [Vol.76,p.569.] 190.

A feature is the start button inside the stop button. Thus, the stop button can be operated merely by striking the front of the control box, but the start

button must be operated with the finger. Circuits up to 600 volts a.c. or d.c. can be controlled.

Stations, Push-Button Motor

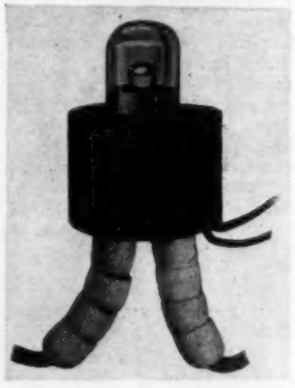
Allen-Bradley Co., 1311 S. First St., Milwaukee, Wis. [Vol.76.p.652.] 235.

The Type N-1060 series of 4-button stations has three running buttons to give three motor speeds and one stop button. The 5-button stations, known as the Type N-1080 series are for use with four-speed motors.

Switches, Mercury, "Magnetrole"

Providence Electric Controls, Inc., 763 Allens Ave., Providence, R. I. [Vol.76,p.654.] 234.

Mercury switches ranging in

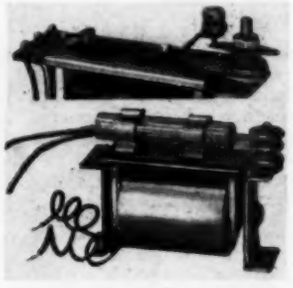


capacity from 1 to 100 amp. are manufactured. In types having a rating up to 5 amp., special heat-resisting contacts are used. In the larger switches arcing takes place over a ceramic surface to eliminate danger of tube breakage.

Relay, Supersensitive

American Instrument Co., 774 Girard St., N.W., Washington, D.C. [Vol.76,p.574.] 194.

Designed to control relatively heavy currents through the limited mechanical impulse of thermostat action or through variations in electrical resistance set up by varying the intensity

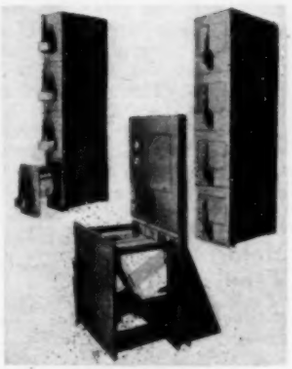


of light striking a photo-electric cell, this line of supersensitive relays will break 1,320 watts with 4 milliamperes, at six volts. Relays can be provided for special purposes with coil resistances up to 50,000 ohms.

Switchboards and Cubicles

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 76,p.657.] 251.

Air or oil circuit breakers,



indicating and recording instruments, dead-front knife switches, and combinations of these four may be put in this line of sectional steel dead-front switchboards. The switchboards are assembled from standard units. These units are placed one above the other to form a stack and stacks are placed side by side to form a section or complete switchboard.

Lamp, Cooper-Hewitt

General Electric Vapor Lamp Co., Hoboken, N. J. [Vol.76, p.315.] 109.

A summary of the changes includes: Improvements in tube design and performance; simplified reflector equipment; simpler and sturdier auxiliary

equipment, and electrical features embodying the latest requirements of the Underwriters' Laboratories. Two styles of tube are now available, one for horizontal operation and the other for vertical operation.

Potentiometer, Indicating

Brown Instrument Co., Philadelphia, Pa. [Vol.76,p.720.] 282.

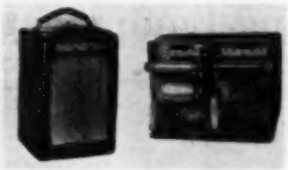
This indicating potentiometer is of the self-balancing type. It has automatic thermal equalization between cold junction ter-

minals and compensation coil. Any range from 0 to 100 deg. F. up to 0 to 3,000 deg. F. can be supplied.

Recording Instruments, "Graphic"

Esterline-Angus Co., Indianapolis, Ind. [Vol.76,p.712.] 243.

Instruments are arranged so that the rolls which drive the chart can be coupled together to synchronize the charts. Synchronous-motor or spring clocks are available. Chart speeds range from ¾ in. per hour to 12 in. per minute.



Furnaces and Equipment

Furnace, Enameling, Electric, Continuous

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. [Vol.76,p.216.] 74.

This continuous electric enameling furnace, rated at about 1,500 sq.ft. of sheet ware per hour, is approximately 40 ft. long overall and is designed to

operate at a chain speed of 4 to 5 ft. per min. It makes it possible for smaller porcelain enameling plants to take advantage of continuous operation.

Furnace, Muffle, High-Speed

Stark Tool Co., Waltham, Mass. [Vol.76,p.254.] 79.

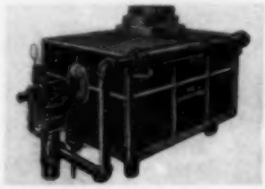
The "Electroblast" gas-electric blow torch acts as the burner for this furnace, fitted with heavy insulation to make possible a tempe ature of 1,600 deg. F. in 6 min., 2,400 deg. F.

in 15 min., and a maximum temperature of 2,600 deg. F. Muffle dimensions are 6½ in. long, 3¼ in. wide and 2⅛ in. high, sufficiently large to handle the general run of toolroom high-speed hardening.

Forge, Oil, Production

Naudain Mfg. Co., 1001 Rectory Lane, Baltimore, Md. [Vol. 76,p.442.] 117.

This oil-fired production forge is constructed of cast-iron plates, strongly ribbed and bolted. A sliding plate is provided at the bottom to open the slag outlet hole under the heating chamber. Lugs are provided on both sides for work rest brackets.



Bright-Annealing Equipment, "Drinox"

Charles F. Kenworthy, Inc., Waterbury, Conn. [Vol.76,p. 629.] 188.

A neutral non-oxidizing atmosphere envelopes the charge in a specially constructed, covered magazine during annealing and cooling. The furnace is heavily incased in a steel shell and stands on three steel columns. A small hydraulic ram in the floor directly beneath the furnace opening carries a horizontally rotating six-station load platform eccentrically. The platform provides loading, annealing and cooling stations.

Quenching Tank, Automatic

N. Ransohoff, Inc., Cincinnati, Ohio. [Vol.76,p.626.] 214.

Installed in a pit in the floor, this automatic quenching tank is equipped with baffle plate to circulate the cooling compound. Heat-treated work slides down

a grating from the furnaces onto an open mesh conveyor, passes through the tank and is discharged into a container at the opposite end.

Pyrometer, Recording, Type SR

Hoskins Mfg. Co., Detroit, Mich. [Vol.76,p.345.] 122.

This portable, electrically driven recording pyrometer weighs 17 lb. The chart is driven by a self-starting synchronous electric clock movement. A circular chart, 8½ in. in diameter, provides a 24-hr. temperature record.

Pyrometer Lamp

Nela Park Lamp Development Laboratories of General Electric Co., Cleveland, Ohio. [Vol.76,p.539.] 195.

This pyrometer lamp, claimed to measure within 5 to 10 deg. C. of the temperature of a furnace, consists of a black-coated, pear-shaped bulb containing an inverted U-shaped

carbon filament and a small eyelet about ¼ in. apart. These are mounted midway between two windows in the bulb and are compared by varying filament brightness to match that of the furnace.

Temperature Signal, Electric

Uehling Instrument Co., Paterson, N. J. [Vol.76,p.746.] 292.

The instrument case embodies colored electric lights. The case may be located at any distance away from the thermometer bulb. Lights are caused electrically to signal the temperature conditions.

Tray, Hardening, Non-Metallic

Sentry Co., Taunton, Mass. [Vol.76,p.185.] 38.

These non-metallic trays, used in connection with "Diamond Blocks" for hardening high-speed tungsten, molybde-

num and cobalt steels, are not affected by the neutral atmosphere produced by the block. High-speed tools can be hardened to retain the original surface.

Material Handling Equipment

Crane, "Loadmaster"

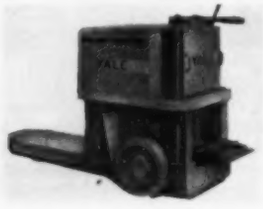
Bucyrus-Erie Co., South Milwaukee, Wis. [Vol.76,p.775.]

The "Loadmaster" crane is now built with either Case or McCormick-Deering power, and the capacity of the crane has been increased to 4,500 lb. It is furnished with wheel or crawler mounting.

Trucks, Electric, Midget, "KM Series"

Yale & Towne Mfg. Co., Philadelphia Div., Philadelphia, Pa. [Vol.76,p.147.] 21.

Model KM3L illustrated has 3,000 lb. capacity and is of the low-lift type. Other models comprise: 3,000-lb. model for



high lift; 4,000-lb. models for low and high lifts; high- and low-platform load-carrying types, as well as lift-fork trucks.

Truck, Low-Lift

Automatic Transportation Co., Inc., 101 West 87th St., Chicago, Ill. [Vol.76,p.155.] 34.

The Model LG-2 low-lift truck has a capacity of 4,000 lb. A spur-gear drive is employed,

together with larger driving wheels. The truck is designed to maneuver in much closer quarters.

Truck, Tiering, Tilting

Automatic Transportation Co., Inc., 101 W. 87th St., Chicago, Ill. [Vol.76,p.440.] 156.

Telescopic upright members are employed in this tilting, tiering fork truck. Capacities are 1,000 to 6,000 lb. A double roller-chain lifting mechanism is used to give high elevating speed and safety regardless of the position of load. Tilting is accomplished by two heavy-duty links connected to the tilting mechanism.

Truck, Lifting and Tiering, Finger-Type

Clark Tructractor Co., Battle Creek, Mich. [Vol.76,p.442.]

This lifting and tiering truck, which wil pick up cleated loads with 2 in. under-clearance, carries the load on tapered steel fingers having a standard length of 26 in. The 2-ton model has

a turning radius of 89 in.; 3-ton model, 98 in. The truck is gas-powered. It is capable of tiering to a height of 50 in.

Tramrail Systems

Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland, Ohio. [Vol.76,p.719.] 284.

The systems include the following equipment: T-rail and beam rail of patented design; fittings for all ceiling conditions; switches, crossovers, turntables; Yale & Towne chain blocks; Shepard electric hoists; new type trolleys; cranes and transfer bridges; complete electric and hand-propelled systems.

Transmission Equipment

Speed Reducer, Worm Gear, Size 5-HG

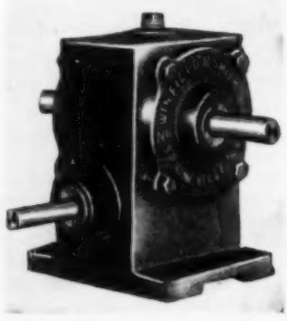
Foote Bros. Gear & Machine Co., 215 North Curtis St., Chicago, Ill. [Vol.76,p.252.] 31.

Ratios vary from 3.5:1 to 3,000:1. Five types are built—HGS, having the worm at the bottom; HGT, with the worm on the top; HGV, with the worm gear shaft vertical; HGX, consisting of a worm reducer with helical attachment, and HGD, having a double worm and worm gear reduction. Maximum torque of the slow-speed shaft is 1,375 in.-lb.

Speed Reducers, Worm Gear

Winfield H. Smith, Inc., Springville, Erie County, N. Y. [Vol.76,p.572.] 210.

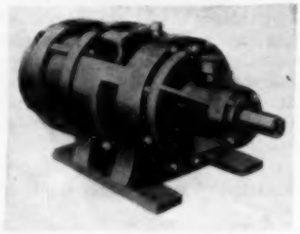
No. 3½B permits loads up to ¼ hp., and has a housing with solid top and large side cover plates. This construction permits keying the worm gear to the shaft. Standard ratios are 58:1, 36:1, 18:1 and 9:1. No. 4½T is designed for medium-duty service. Standard ratios vary from 1-6 to 1-60, with hp. outputs from 1.5 to 0.25.



Speed Reducer, Motorized, Planetary-Type

Gears & Forgings, Inc., Cleveland, Ohio. [Vol.76,p.28.]

This motorized speed reducer is designed particularly for applications where available space for the driving mechanism is limited. The housing for the

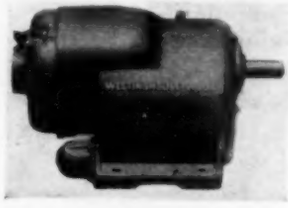


reduction gears is integral with the base. Thirty-four standard ratios are available, ranging from 4:1 to 240:1 inclusive, and sizes range from ¼ to 30 hp.

Motor-Gear Units, Westinghouse-Wood

H. C. Wood Machine Works, 514 Bryant St., San Francisco, Calif. [Vol.76,p.411.] 13.

Units may be obtained to give 900 to 60 r.p.m. on the outgoing shaft, using an 1,800 r.p.m. motor, or down to 30 r.p.m., using a 900 r.p.m. motor. A slow-speed shaft can be had



on one end of the motor and a standard-speed shaft on the opposite end. The motors can be furnished in polyphase, single phase, or d.c. designs in sizes from ½ to 7½ hp.

Gearmotors

Westinghouse Electric & Mfg. Co., Nuttall Works, Pittsburgh, Pa. [Vol.76,p.32.] 18.

A Type CS general-purpose

induction motor and a double-reduction, non-planetary type, helical-gear speed reducer are built onto the one-piece motor frame. Gearmotors are built in sizes of ½ to 15 hp. with a wide selection of output ranging from 69 to 1,550 r.p.m.

Transmission and Reduction Unit, Variable-Speed

Lenney Machine & Mfg. Co., Warren, Ohio. [Vol.76,p.569.]

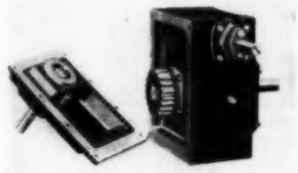
Speeds from 15 to 150 r.p.m., with a 1,750 r.p.m. motor, are obtainable from this variable-speed transmission and reduc-

tion unit. Forward, neutral and reverse can be accomplished by a shift lever while the motor is in motion. Speed is controlled by a handwheel and may be changed while the unit is operating.

Reversing Unit, Two-Speed

Ohio Gear Co., 1333 W. 179th St., Cleveland, Ohio. [Vol.76, p.31.] 25.

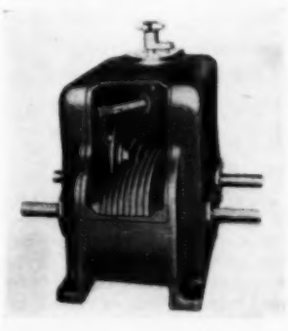
When this two-speed reversing unit is used as a substitute for bevel gear reversing, it permits the clutch to be placed



where most convenient, instead of between the two ends of the shafts. The two speeds may be arranged for 1:1 ratio or any other reasonable ratio.

Transmission, "Multi-Speed"

General Radial Drill Co., 1767 Elmore St., Cincinnati, Ohio. [Vol.76,p.717.] 288.



No slippage occurs in the transmission because the idler disk sets up a wedging action in direct proportion to the load it transmits. Speed changes are made by means of a star knob on top. The grooved cones are of steel. The composition disk runs as an idler between the cones. Ratios may be had in eight speed changes up to 9 to 1 and in sizes from ¾ to 10 hp.

Clutch, Ramsey-Pulvis

Ramsey Chain Co., Albany, N. Y. [Vol.76,p.282.] 86.

The Pulvis principle consists of the gradual transmission of power by centrifugal packing of hardened steel shot against

driving and driven elements of the clutch. The clutch can be made as part of the driving member, such as silent or roller chain, flat belt, multiple V-belt, and all gear types, as well as a coupling on direct-connected drives. Any capacity up to 400 hp., 200 r.p.m. can be handled.

Clutches, "Pullmore"

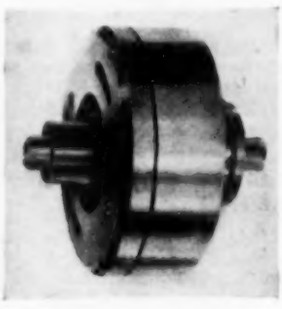
Morse Chain Co., Ithaca, N. Y. [Vol.76,p.348.] 112.

This multiple-disk friction drive unit is made up in six standard sizes, single or double,

from ⅞ to 2¼ in. shaft diameters and from 2 to 25 hp. at 500 r.p.m. It is furnished either to operate in an oil bath or dry.

Clutch and Clutch Coupling, Magnetic

Dings Magnetic Separator Co., Milwaukee, Wis. [Vol.76. p.476.] 152.



The friction clutch has contact faces on both sides of a spring disk, which is squeezed between the magnet and armature elements when the coil is energized. Provisions are made in the clutch for adjustment to compensate for wear of the contact faces. The magnetic clutch-coupling can be applied wherever synchronizing the speeds of two power drives is required.

Clutch, Magnetic

Magnetic Mfg. Co., Milwaukee, Wis. [Vol.76,p.775.] 308.

This multiple-disk magnetic clutch measures only 4½ in. in diameter and requires 30 watts

d.c. for operation. Torque capacity is 600 in-lb. The unit is designed for a built-in machine tool drive.

Coupling, Buffer-Slot

Brown Engineering Co., 123-127 N. Third St., Reading, Pa. [Vol.76,p.803.] 316.

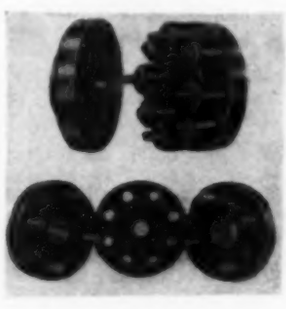
Buffer-slots cut at regular intervals in the flexible leather disk of this coupling give flexi-

bility and permit the coupling to be used under conditions of angular and parallel misalignment and shock loads.

Coupling, Flexible

F.A.B. Mfg. Co., 67th & Vallejo Sts., Oakland, Calif. [Vol.76,p.412.] 49.

Shock-resistance and a method of eliminating vibration are embodied in these flexible couplings in addition to compensa-

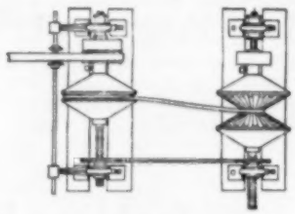


tion for parallel and angular misalignment. Couplings will operate at speeds up to 3,450 r.p.m. Sizes are manufactured for transmitting to 1,200 hp.

Countershaft, Variable-Speed

Buffalo Gear & Pattern Works, 18-20 Elk St., Buffalo, N. Y. [Vol.76,p.476.] 120.

This variable-speed countershaft that may be powered directly by a motor or driven from a lineshaft. A leather belt

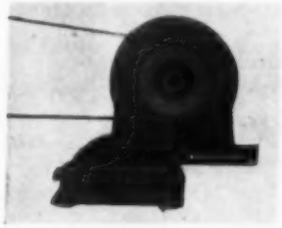


connects the two separable-face pulleys mounted with one half fixed on the shaft and the other half capable of displacement along the screw by a Link Belt chain.

Drive, Short-Center, Improved

Rockwood Mfg. Co., 1801 English Ave., Indianapolis, Ind. [Vol.76,p.29.] 8.

The base is now equipped with adjustable arms for the motor, and the drive is now adaptable to all kinds of motors built for 25, 50 or 60 cycles, single or polyphase, a.c. or d.c.



The first feature gives means for securing the correct belt tension so that the life of the belt is increased. The list of drives in stock has been increased to 100 hp., 1,800 r.p.m.

Pulleys, Vacuum Cup

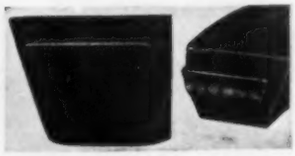
Keystone Engineering Co., Inc., 850 Maccabees Bldg., Detroit, Mich. [Vol.76,p.601.] 139.

Vacuum cups spaced over the face of this metal cup pulley minimize slip. Pulleys are available with a setscrew and standard keyseat in sizes from 3 to 16 in. in diameter by 2x14-in. face.

V-Belt, "Condor"

Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J. [Vol.76,p. 31.] 16.

For light-duty, high-speed work, a flexible "Whipcord" construction is employed, and for heavy-duty service "Plycord" has been evolved. Whipcord consists of one layer of continuously wound cords imbedded in two layers of tie-gum. Plycord is made up of continuously wound plies of cord with



one layer of tie-gum between each.

Belting, Leather

Graton & Knight Co., 356 Franklin St., Worcester, Mass. [Vol.76,p.508.] 185.

This leather belting, in which permanent stretch is claimed to be practically eliminated, is being marketed under the trade name of "Research." The new leather also is claimed to have much higher friction qualities and to be more flexible.

Welding Equipment

Blowpipes, Natural-Gas

Torit Mfg. Co., 174 West Third St., St. Paul, Minn. [Vol.76,p.188.] 65.

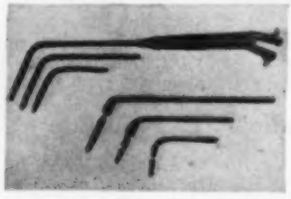
This line of blowpipes uses natural gas together with compressed air. They are supplied for soldering, light brazing,

tempering, melting, rebabbitting, wire splicing, core drying and various operations requiring heat, but not for welding.

Torch, Welding, Type HMS

Alexander Milburn Co., 1416-1428 W. Baltimore St., Baltimore, Md. [Vol.76,p.254.] 90.

Type HMS welding torch is for all types of welding. Copper swaged welding tips are usually furnished, but they may



be replaced by extensions of various lengths. These extensions utilize the company's standard Type FX and UB welding tips.

Torch Cutting and Welding No. 960

Tips, Inc., 515 Cathedral St., Baltimore, Md. [Vol.76,p.540.]

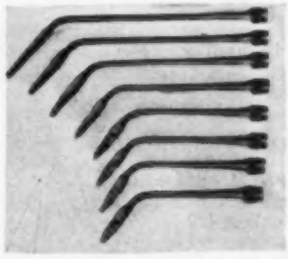
This torch has been improved in design and will cut or weld

normal thicknesses of metal, the torch being prepared for welding by changing the tip. Valves and base are of forged bronze. Tubes are triangularly arranged to give increased transverse strength.

Welding Heads, "Oxweld"

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.252.]. 88.

This series of No. 6 to 13 welding heads with detachable tips is for use with the "Oxweld" Type W-17 welding blow-



pipe, and supplement one-piece style heads. They are especially useful in production operations.

Tip Adaptor, Purox

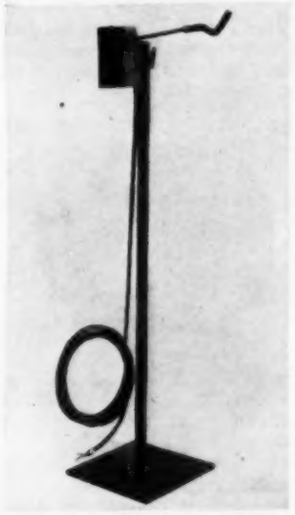
Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.286.] 100.

By means of this tip adaptor it is now possible to use the stems and tips of the No. 00-D aircraft welding torch and the stems and tips of the No. 00 welding and lead burning torch on the No. 11 welding torch.

Holder Stand, Electrode

Lincoln Electric Co., Cleveland, Ohio. [Vol.76,p.745.] 291.

This electrode holder stand automatically shuts down the welder one minute after the holder is placed on the stand and instantly starts the welding set when the holder is re-

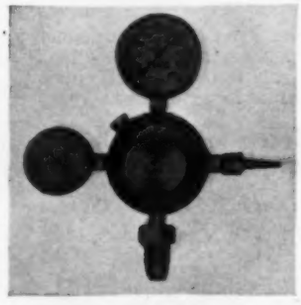


moved. The "Power Saver" can be used whenever the welding equipment is provided with an automatic motor starter.

Regulators, Oxygen and Acetylene, "Purox"

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.186.] 36.

This series of improved "Purox" oxygen and acetylene regulators supersedes the former line of "Purox Metal Mas-



ter" regulators. The series comprises six regulators, designated as Nos. 33 and 34 for acetylene; Nos. 13, 14, 23 and 24 for oxygen.

Regulators, Types R48 and R49

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.684.] 259.

Type R-48 oxygen regulator and Type R-49 acetylene regulator are for use with the Type W-15 welding blow-pipe. They are of the stem type with a bonnet held in place by a forged

brass cap ring which assures a non-leaking diaphragm. Hose connection on the R-48 is ¼ in.; the R-49, ⅜-in.

Welding Rod, Bronze

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.411.] 151.

This "Oxweld" No. 25M bronze welding rod is for use in rebuilding wear-resisting surfaces. The rod is non-fuming and free-flowing. It is possible to remelt and reweld welds made with this welding rod. Hardness of weld metal is 96 Brinell. Three sizes supplied are ⅛ 5/32 and ¼.

Welding Rods and Electrodes

Bastian-Blessing Co., 240 E. Ontario St., Chicago, Ill. [Vol. 76,p.683.] 257.

A complete line of welding rods, including special types such as high-speed and high-test materials, is being marketed under the trade name of "RegOroD."

Welding Rod in Coils, Aluminum

Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.683.] 272.

Both Oxweld No. 14 drawn aluminum rod for welding sheet aluminum and No. 23 aluminum rod for welding cast and sheet aluminum and aluminum alloys are now available in the form of 10-lb. coils of ⅛-in. diameter rod.

Electrodes, Coated, "Murex"

Metal & Thermit Corp., agents for American Murex Corp., 120 Broadway, New York, N. Y. [Vol.76,p.151.] 56.

These arc welding electrodes are of the extruded type and consist of a bare wire on which asbestos yarn is wound in an open spiral. A specially prepared mineral flux is put on the

rods. Among the eight types of electrodes in the Murex line there are electrodes for welding commercial mild steel, manganese steel, 18-8 stainless, and stainless iron.

Electrodes, "Hi-Tensile"

Page Steel & Wire Co., Monessen, Pa. [Vol.76,p.285.]

This coated electrode gives quiet operation with little or no spitter. The arc is free burning. Grain structure of the weld is essentially the same as that of mild steel and boiler plate base metal. The electrode possesses an extra deep penetration, and the strength of the finished weld is equal to that of the base metal.

Electrode for Welding Aluminum, "Aluminweld"

Lincoln Electric Co., Cleveland, Ohio. [Vol.76,p.314.] 110.

"Aluminweld" electrode is a 5 per cent silicon-aluminum alloy. The coating provided on the electrode prevents excessive oxidation and will dissolve any aluminum oxide that might be formed. The resulting weld can be polished satisfactorily. Four sizes are: $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$ and $\frac{3}{16}$ in. in 14 in. lengths.

Electrode, 18-8

Jos. T. Ryerson & Son, Inc., Chicago, Ill. [Vol.76,p.800.] 317.

The rod is applicable to Allegheny Metal and other stainless steels in the 18-8 chrome-nickel group and does not increase carbon content. The special flux coating produces a non-active gas which prevents oxygen from attacking the metal. The heavy slag acts as a protective agent.

Flux, Cromaloy

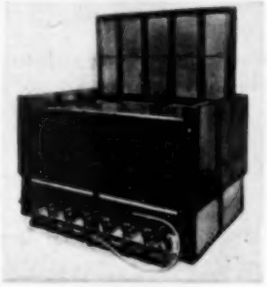
Linde Air Products Co., 30 E. 42nd St., New York, N. Y. [Vol.76,p.251.] 96.

Cromaloy flux has been developed especially for use in welding the chromuim-containing alloys known as stainless steels or rustless irons. This flux is sufficiently fireproof to protect the molten metal and hot metal adjacent to the weld from oxidation, and at the same time to dissolve the refractory chromium oxide quickly.

Oven, Preheating, for Welding Castings

Crawford Oven Co., New Haven, Conn. [Vol.76,p.314.]

This preheater is built in two sections, the burner section below and the heating chamber above. The upper section is



built with sliding doors at the front, back, top and at each side. Through these sliding doors any part of the work can be reached by the welder. The preheater has a heater section 5 ft. long, 3 ft. wide and 2 ft. high.

Alloys

Aluminum Alloys, "Nicral"

Nicralumin Co., 146 W. Cortland St., Jackson, Mich. [Vol. 76,p.627.] 233.

In this system of aluminum alloys containing nickel and chromium, Brinell hardness varies from 40 to 120, depending upon grade and temper, and almost any demand of hardness and strength can be met. The color resembles chromium plate, and all grades maintain a polished surface without excessive tarnishing. They are suitable for drawing and forming, have good resistance to fatigue, are weldable, have high coefficients of reflectivity, and cast well.

Steel, Stainless, No. 8

Carpenter Steel Co., 117 W. Bern St., Reading, Pa. [Vol. 76,p.65.] 27.

This free-machining 18-8 stainless steel supplements stainless No. 5 chrome iron. Corrosion-resistance of this high-sulphur stainless is about the same as the low-sulphur stainless No. 4 and may be used interchangeably. The choice between them lies chiefly in the manner in which the parts are to be fabricated. No. 8 is offered for parts that must be machined and No. 4 for parts bent, drawn or formed to shape.

Steel, "Nevastain RA"

Associated Alloy Steel Co., Cleveland, Ohio. [Vol.76,p.477.]

"Nevastain RA" is said not to work harden to the same extent as usual for stainless steel alloys. It also does not require high temperature heat-treatment for annealing. It is free machining, and is also susceptible to fabrication by welding without grain growth. Average properties for hot-rolled bar stock are: ultimate strength, 100,000-130,000 lb. per sq.in.; yield point, 50,000 - 70,000; elongation, 17-25 per cent.

Silicon-Bronze Alloy, "Herculoy"

Revere Copper & Brass Inc., 230 Park Ave., New York, N. Y. [Vol.76,p.801.] 313.

"Herculoy" is claimed to possess the advantages of strength and corrosion resistance which characterize the silicon bronzes, and has properties which render it more readily adaptable to fabricating operations. Its strength is comparable to that of low and medium carbon steel and its corrosion-resistant qualities approximate those of pure copper. The alloy is available in the form of sheets and plate; rolls and strips; rods; bars and shafting; die pressed or hammered forgings; rivets; welding rods and in ingot form for sand castings.

Parts and Mechanisms

Bearings, Oil-less, Spiral-Type

E. A. Williams & Son, Inc., 111 Plymouth St., Jersey City, N. J. [Vol.76,p.538.] 182.

Designed for sliding or oscillating motion with the axis either vertical or horizontal, this spiral-type oil-less bearing

will operate at speeds to 2,500 r.p.m., depending upon load, and at temperatures not above 400 deg. F.

Bearings, Roller, Full-Type

Bantam Ball Bearing Co., South Bend, Ind. [Vol.76,p. 383.] 137.

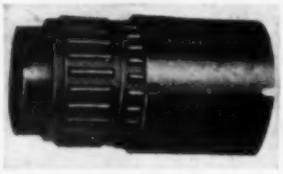
These bearings have two lips on the inner rings or cone, and one lip on the outer ring or cup, with a detachable spring-steel locking lip on the other side.

This construction allows the bearing to take a limited amount of thrust load in one direction.

Bearing, Roller, Special

Bantam Ball Bearing Co., South Bend, Ind. [Vol.76,p. 746.] 260.

A special double-row cylindrical roller bearing for limited space has two sets of rollers, operating in independent cages so as to minimize skew effect of the rollers. On the standard type the rollers are $\frac{1}{4}$ in. in diameter and the races have $\frac{1}{4}$-in. wall thickness.



Bushings and Pins, Railroad

Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman Blvd., Detroit, Mich. [Vol.76,p.314.] 111.

Hardened and ground brake bushings and brake pins have been developed for the maintenance of clasp brakes on passenger cars and locomotive tenders. These pins and bushings have a case of approximately $\frac{1}{32}$ in. and are ground to definite limits.

Lockwashers and Nuts, Combination, Bracketite

National Machine Products Co., 4850 Bellevue Ave., Detroit, Mich. [Vol.76,p.629.] 241.

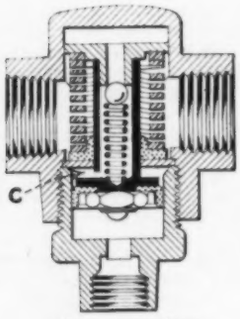
The lockwasher is fastened over a shoulder on either the nut or the capscrew, thus en-

abling it to perform its usual function in assembly, yet permitting it to be applied as a single unit.

Lubrication System, "Metro-Matic"

Alemite Corp., 2650 N. Crawford Ave., Chicago, Ill. [Vol. 76,p.441.] 133.

Measuring valves, located at points along the pipe line near the bearings, discharge a predetermined amount of lubricant at each operation of the pump, which is a high-pressure, hand-plunger type. The measuring

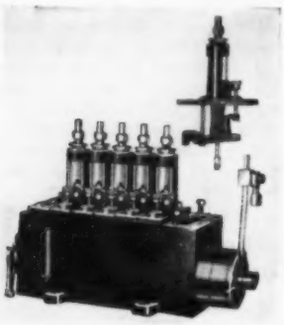


valves can be connected in multiple, and as many branches as necessary can be taken off at any point. The hand pump can be filled by hand or by means of standard Alemite filling equipment.

Lubricator, Force-Feed, No. 451

S. F. Bowser & Co., Inc., Fort Wayne, Ind. [Vol.76,p.747.] 242.

This force-feed lubricator has a single plunger that serves the dual purpose of drawing the oil from the reservoir and forcing

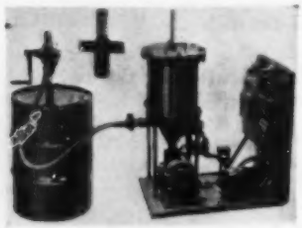


it in a straight vertical path through the sight glass to the point of lubrication. Each pumping unit is individually adjusted.

Lubricating System, Single-Line, Multi-Feed

Hills-McCanna Co., 2349-2350 Nelson St., Chicago, Ill. [Vol. 76,p.803.] 325.

The main unit is placed in a convenient location, and a single feeder line is taken to the farthest point requiring lubri-



cation. Branch lines are taken to each bearing, at which is a mechanical measuring unit. The system can be motor-driven or linkage- or hand-operated.

Oil Seal, Four-Part

Aetna Ball Bearing & Mfg. Co., Chicago, Ill. [Vol.76,p. 536.] 183.

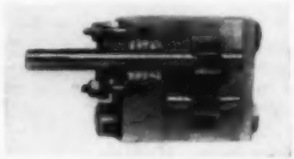
This oil seal consists of an outer shell of steel ground on the outside diameter and housing the seal cushion, pressure

plate and steel retainer. The seal cushion consists of cork. Sizes from ½ in. inside diameter and up are available.

Pumps, Rotary XE Series

Northern Pump Co., Minneapolis, Minn. [Vol.76,p.540.]

This XE Series of Nitralloy rotary pumps uses the same laminated plate construction worked out in the two smaller Series XA and XD. Nitralloy

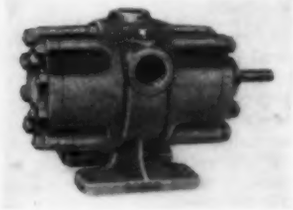


pumps are now available with capacities from ¾ g.p.m. to 42 g.p.m. at 1,200 r.p.m., the range of the new series being 14 to 42 g.p.m. at 1,200 r.p.m.

Pumps, Hydraulic

Geo. D. Roper Corp., Rockford, Ill. [Vol.76,p.683.] 273.

Series 996 and 998 pumps will develop pressures up to 300 lb. per sq.in., while Series 999 will develop pressures up to 100 lb. Series 996 pumps have single-row ball bearings, while the other two series incorporate sleeve bearings. All three types of pumps have herringbone gears, one of steel, the other of brass. The first pumps have capacities ranging from 4 to 100 gal. per min., and are made in



nine sizes. Series 999 pumps are made in ten sizes, ranging in capacity from 1 to 100 gal. per min.

"Rivet Bolts"

Dardelet Threadlock Corp., 120 Broadway, New York, N. Y. [Vol.76,p.238.] 95.

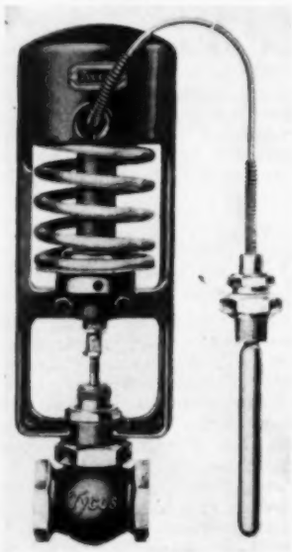
Rivet bolts have a standard round head, a splined body approximately 1/32 in. larger than the drilled rivet hole, and a shank threaded with the standard Dardelet thread to prevent

backing off by the nut under severe vibration. The bolt may be made in a steel that has an ultimate strength of 80,000 lb. per sq.in.; higher-strength steels can be used, often heat-treated. The rivet bolt can be removed quickly and used again.

Temperature Regulator, Self-Acting Tycos

Taylor Instrument Co., Rochester, N. Y. [Vol.76,p.573.]

Elimination of friction, which results in immediate action of the valve stem corresponding to a temperature change is in-



corporated, in this Tycos regulator. The tube system is also of new construction, being a double seamless bellows with heavy copper connection tubing and small rustless steel bulb with thin wall.

Screws, Hollow, Chrome-Molybdenum

Allen Mfg. Co., Hartford, Conn. [Vol.76,p.30.] 6.

Substitution of a chrome-molybdenum steel for the steel formerly employed increased tensile strength of these screws 50 per cent and Rockwell hardness 25 per cent. The screws are available in all sizes commonly used.

Strainer, Pipe-Line, Self-Cleaning

Jas. P. Marsh & Co., Chicago, Ill [Vol.76,p.189.] 14.

This self-cleaning strainer for installation on the return line of low, medium and high-pressure systems up to 125 lb. per sq.in. will eliminate dirt, grit and scale, and can be installed

either horizontally or vertically. It is self-cleaning and draining when the plug is out or the blow-off valve is open. The strainer is made in six sizes, ½, ¾, 1, 1¼, 1½ and 2-in. pipe sizes.

Tubing, Flexible, Seamless

American Metal Hose Co., Waterbury, Conn. [Vol.76,p. 446.] 121.

Seamless flexible tubing is being offered for uses where excessive flexing is encountered, where material to be conveyed would affect the packing in ordi-

nary metal hose fabricated from metal strip, and also where slight seepage would be dangerous. It is stocked in seamless steel and brass in sizes of ⅜ to 2 in.

Valves, 4-Way, Balanced

Vickers, Inc., 7742 Dubois St., Detroit, Mich. [Vol.76,p.316.]

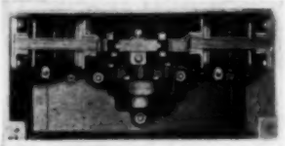
Hydraulic balance in these 4-way control valves is said to prevent binding due to pressure and to give sensitive operation. These compact valves are easily applied to machine tools and are

used for operating pressures up to 2,000 lb. per sq.in. Three types are made: latch-controlled, pilot-controlled and manually controlled.

Valves, Air, Electrically Operated

Hannifin Manufacturing Co., 621 S. Kolmar Ave., Chicago, Ill. [Vol.76,p.571.]

Model C is furnished in both single and double types for remote control of either single or double-acting air cylinders and can be operated from one or

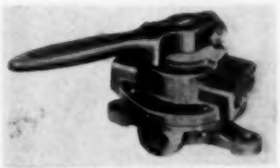


more push-button stations. Model D is designed for time-cycle operation or remote control of an air cylinder. Model E is for 4-way control of double-acting air cylinders.

Valve, Air Control, Duplex

Hannifin Mfg. Co., 621 S. Kolmar Ave., Chicago, Ill. [Vol.76,p.571.]

For use on machines that employ two air cylinders operating in progressive sequence,



this duplex air control valve has four independent outlet ports for control of two double-acting cylinders in either direction and in any sequence desired. It is available in two sizes, Model D-37 with ⅜ in. I.P. connections, and Model D-75 with ¾ in. I.P. connections.

Valve, Air Saver

Briggs & Stratton Corp., Milwaukee, Wis. [Vol.76,p. 802.] 314.

The device supplies automatic, intermittent control of compressed air blasts for ejecting

work, keeping dies and tools clean, and other operations. It is used on punch presses and on machine tools.

with three shelves and top and bottom trays. Width is 21¼ in., depth 15¼ in. and height 34 in. Shipping weight, 102 lb.

Compressors, Air, Supercharged

LeRoi Co., Milwaukee, Wis. [Vol.76,p.30.] 23.

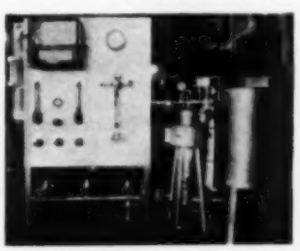
Air compressors incorporating the Rix patented supercharger principle are available in displacement capacities of 100, 200, 300, 400, 500, 600, 800, 1,000 and 1,200 cu.ft. per minute. Efficiency of 85 per

cent is reached at 100 lb. per sq.in. pressure. The unit is mounted on a single base with its driving motor. A V-belt drive can be supplied or a direct connected motor is available. An automotive radiator core for a self-contained unit or circulating water can be used for cooling.

Dissociator, Ammonia

Westinghouse Electric & Mfg. Co., Mansfield, Ohio. [Vol.76,p.221.] 73.

This equipment for dissociating liquid anhydrous ammonia is available in three standard sizes, capacities of which are 50, 250 and 600 cu.ft. per hr. It is simple to operate, being prac-



tically automatic. Dissociation of anhydrous liquid ammonia gives 75 per cent hydrogen and 25 per cent nitrogen by volume. Dissociation is about 99.5 per cent.

Dissociator, Ammonia

Ajax Electric Co., Frankford Ave. & Allen St., Philadelphia, Pa. [Vol.76,p.747.] 294.

The apparatus yields a dry gas containing 75 per cent hydrogen and 25 per cent nitrogen, using anhydrous ammonia as the raw material. Dissociators are

offered in the following sizes: 50, 150, 300 and 500 cu.ft. per hour, complete with controls.

Drafting Machine, Improved, Bruning-Wallace

Charles Bruning Co., Inc., 818 Santee St., Los Angeles, Calif. [Vol.76,p.573.] 213.

Ball bearing equipped throughout and with tubes and scale plate of duralumin, this improved drafting machine may be pushed out of the way to leave

the top of the drafting table free. The protractor provides automatic stops at 0–30–45–60 and 90 deg. in all four quadrants. Working radius of the standard-size unit is 44 in., or an 88-in. circle. Tube arms are 19¼ in. long. Other sizes and left-hand units are supplied on order. All steel parts are of tool steel, chromium plated. The protractor is of nickel silver.

Scale, Printweigh, Improved

Toledo Precision Devices Inc., Toledo, Ohio. [Vol.76,p. 600.] 226.

The Toledo "Printweigh" scale has recently been extended in use through three improvements: selective numbering device, delayed time switch and application of the photo-electric tube. The selective numbering device provides a system of identification for dating, batch numbering, grading and numbering, by lot, by operators or by employee group numbers. The delayed time switch simplifies use of this scale in a con-

Miscellaneous Equipment, Processes and Supplies

Blower, Electric Model 4

Breuer Electric Mfg. Co., 852 Blackhawk St., Chicago, Ill. [Vol.76,p.477.] 171.

This portable electric blower is used for blowing dust out of motors and machinery parts, vacuum cleaning of stock rooms and bins, and for spraying.

Cabinet, Tool

Stackbin Corp., Providence, R. I. [Vol.76,p.315.] 119.

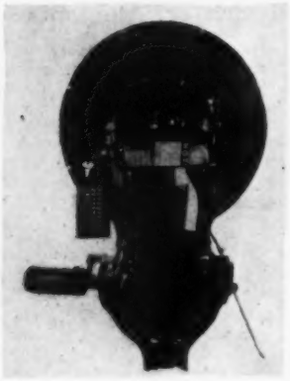
This inclosed type, sheet-steel

machine tender is for the use of machine tool operators. The tender is equipped with a shelf, bench top and two doors provided with a padlock hasp. The size is 18 in. deep by 30 in. wide by 32 in. high.

Cabinet, Tool

Lyon Metal Products, Inc., Aurora, Ill. [Vol.76,p.537.] 271.

This steel tool cabinet is fitted



veyor system. Electric eye makes the printing operation automatic, if desired.

Cadmium-Plating Process, "Cadux"

Hanson-Van Winkle-Munning Co., Matawan, N. J. [Vol.76, p.540.] 189.

The silver-white color is due to the fine crystalline structure of the deposit, which increases the protection of base metals. Current densities ranging from 10-20 amp. per sq.ft. can be used in still tanks or automatic plating apparatus. A deposit obtained in 10-15 minutes will be sufficient to obtain a rustproof coating. For lighter coatings on steel that is to be held in storage a deposit from 2-3 minutes it all that is required. The "Nitri-Brite" dip process produces a luster closely approximating that of hand-buffed work.

Casehardening Process, "Chapmanizing"

Chapman Valve Mfg. Co., 203 Hampshire St., Indian Orchard, Mass. [Vol.76,p.719.] 285.

"Chapmanizing" is a form of hardening by which ordinary carbon steels can be case-hardened to a depth of approximately 0.025 in., the case thereby produced being hard enough to scratch glass.

Calculator, Speed

Foster Machine Co., Elkhart, Ind. [Vol.76,p.250.] 89.

This machine speed calculator for use in the shop and also in time study and engineering departments can be used in con-

junction with almost any type of machine for selecting proper spindle speeds.

Floor Slab, Steel

H. H. Robertson Co., Pittsburgh, Pa. [Vol.86,p.686.] 278.

A steel floor slab, 24 in. wide and up to 12 ft. 5 in. in length, is fabricated by preforming two steel sheets and subsequently welding them together in the plane above the neutral axis. A cross-section taken through the width of a completed unit shows four keystone-shaped cells, all connected together near the neutral axis.

Galvanizing Flux, No. 20

Hanson-Van Winkle-Munning Co., Matawan, N. J. [Vol.76, p.507.] 161.

This No. 20 galvanizing flux is suitable for all types of galvanizing, including wire and wire products. The flux may be dissolved in water.

Greases and Oils, "Lubriplate"

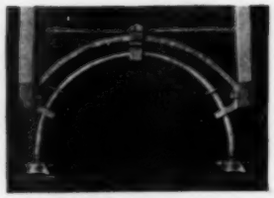
Lubriplate Corp., 3114 Chrysler Bldg., 405 Lexington Ave., New York, N. Y. [Vol.76,p. 29.] 7.

Plating a minute zinc film on bearing surfaces is one of the features of "Lubriplate" oils and greases. Defects and tool marks in the metal are filled up with the zinc plating, but the plating is not increased to a point where it disturbs the fit.

Leveling Device for Ladders, Shur-Foot

Ruse Mfg. Co., 312 Dean St., Akron, Ohio. [Vol.76,p.537.] 186.

This semi-circular leveling device carries two ball and socket joints at its base, upon which pads are fitted. This permits adjustment for varying ground conditions. Shoes are of aluminum and are available with three different types of bottom, either a Carborundum abrasive, Goodrich patented rubber vacuum cup for



use on smooth surfaces or cork inserts.

Oiler, Pressure

Techno Products Co., 7523 Santa Fe Ave., Huntington Park, Calif. [Vol.76,p.476.] 170.

This portable pressure-type spray oiler has a cast aluminum body shaped to afford a grip and equipped with a trigger for

thumb operation. A long adjustable nozzle provides one-hand oiling. Air to create the pressure is supplied by hand pump or other pressure outlet.

Paint, Aluminum

Aluminum Industries, Inc., Cincinnati, Ohio. [Vol.76,p. 152.] 50.

This paint is supplied ready mixed and may be applied to wood, metal, fiber, stone or wherever a preservative paint is required. Permite Resalum is heat resisting, a non-corrosive, moisture-proof, and remains unaffected by weather conditions.

Rust-Preventive Liquid, "Rust-Tox"

Skybryte Co., 1919 E. 19th St., Cleveland, Ohio. [Vol.76, p.186.] 66.

A rust-preventing liquid known as "Rust-Tox" has a dried coating that is glossy and transparent. In refinishing rusted surfaces, it is only necessary to brush off the loose scale and paint or spray with the liquid, which is said to absorb all the moisture content in the rust and to make it chemically inert.

Rubber-Like Compound, "Thiokol"

Thiokol Corp., Yardville, N. J. [Vol.76,p.801.] 319.

A chemical product, which is claimed to have practcially all the characteristics of rubber, but which is not affected by solvents such as rubber is, is an olefin-polysulfide reaction product known as "Thiokol." Like rubber it is compounded and vulcanized.

Solder, "Alumaweld"

Alumaweld Co., Div. of Allied Research Laboratories, Inc., 710 E. Broadway, Glendale, Calif. [Vol.76,p.252.] 78.

A solder for aluminum, cast iron, brass, bronze, copper and other metals has been developed. The solder is claimed to hold pressures up to 1,000 lb. The product can be machined, will take a polish, and the surface can be plated.

Soldering Salts, "Tinol"

American Solder & Flux Co., Wayne Ave. & Berkley Sts., Philadelphia, Pa. [Vol.76,p. 71D.] 263.

Capable of penetrating grease, rust or paint, these Tinol soldering salts are claimed to be particularly adapted for sheet metal work. The material is applied as a powder, then heated.

Swivel Caster

Divine Bros. Co., Utica, N. Y. [Vol.76,p.627.] 224.

Replacement of the king-bolt by a flexible unit features this swivel truck caster, constructed throughout of heat-treated steel

forgings, with chrome-nickel steel balls and Hyatt roller bearings. A full range of sizes is available, with either steel or canvas cushion wheels.

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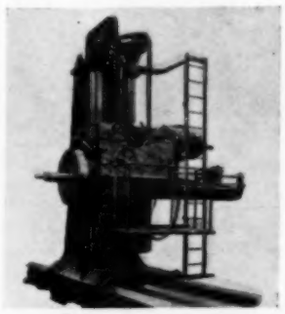
Boring Machines

Boring Machine, Horizontal

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.76,p.90E]. 107.

Built by Collett & Engelhard, the machine has a 5¼-in. spindle with a 2¾-in. internal spindle and a screw-cutting attachment for threads from 3.5 to 12 per



in. Features are: automatic forced-feed lubrication to the upright, one handwheel for all feeds, mechanical cut-out for depth of boring, and simultaneous engagement of the vertical and horizontal feeds for milling in angular directions. Spindle traverse at one setting is 51 in. with extensions of 29 in.

Boring and Facing Machine, Axle-Box

J. Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.76,p.6E.] 142.

For boring, facing and radiusing axle boxes at a single setting, this machine carries at one end a fixed headstock with fac-

ing head and an adjustable headstock at the other with facing head, the headstock being mounted on a saddle which carries the work jigs. Four spindle speeds range from 16 to 54 r.p.m. Eight feeds range from $\frac{1}{64}$ to $\frac{1}{8}$ in.

Grinding Attachment, Boring Mill

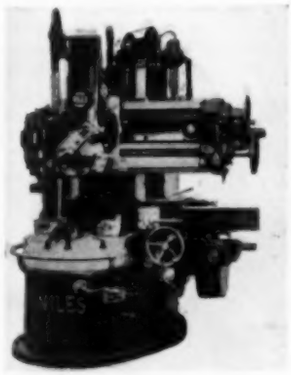
Deutsche Niles Werke A.C., Berlin-Weissensee, Germany. [Vol.76,p.55E.] 75.

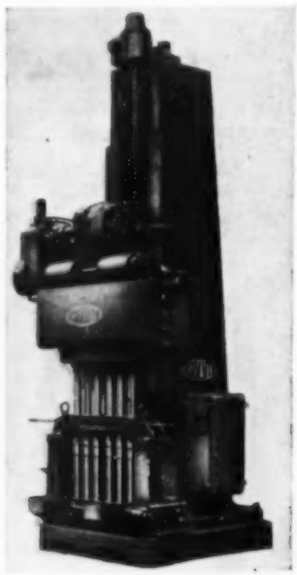
A grinding device fitted to this boring mill has the spindle running in ball and roller bearings, and it is controlled and adjusted with the top slide on the bed of the machine.

Boring Machine, Cylinder, Six-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.176,p.172E.] 144.

This cylinder boring machine is of the supported-bar type. Spindles are driven by two sets of three, by means of worm-wheel drives. They run at 50 r.p.m. and the feed is 2½ in. per min. Maximum and minimum distances from spindle nose to baseplate are 6 ft. 6 in. and 3 ft.; distance from the spindle center to column, 13 in.





Drilling Machines

Drilling Machines

Jones & Shipman, Ltd., Leicester, England. [Vol.76,p. 151E.] 136.

Of the multiple-spindle attachments for the new line of 14 in. ball-bearing sensitive drilling machines, the left-hand view shows a four-spindle attachment which is chain-driven, and which has the spindles adjustable. Distance from spindle to column 7¼ in.; table, 11 in. square, table movement, 27 in.; sliding head movement, 6 in.; spindle taper No. 2 Morse.

Drilling Machine, 23-In.

Adcock & Shipley, Leicester, England. [Vol.75,p.263E.] 28.

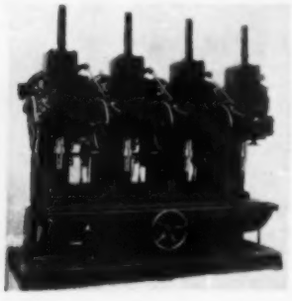
These redesigned machines have belt drive by motor on an extension base, and a circulating pump and coolant tank incorporated. A friction clutch engagement is provided for the

automatic feeds and a slow hand feed. The spindle has ball thrust bearings. Adjustable stops are provided for feed. The machine drills up to 1¼ in. in steel and will tap up to 1¼ in. Whitworth. Maximum distance between spindle nose and table is 27 in.

Drilling Machine, Upright, Four-head

F. Town & Sons, Halifax, England. [Vol.75,p.287E.] 39.

This electrically driven drilling machine will drill holes up to 2 in. in mild steel railway

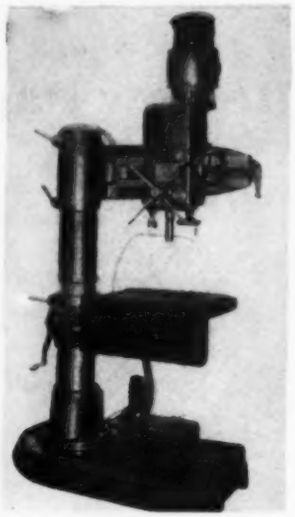


components. Each head is mounted on a standard, bolted to a common baseplate, the latter measuring 10 ft. 9 in. by 4 ft. 4 in. The worktable has a working surface 9 ft. 4 in. by 18 in., and is adjustable 1 ft. 9 in. on standards. Center-to-center distance of the spindles is 2 ft. 7½ in., each spindle having a vertical traverse of 15 in. Distance between spindles and worktable is 2 ft. 4 in.

Drilling Machine, Radial

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.232E.]

Made by Reinhold Bros., Gera-Lusan, Germany, this electrically-driven radial drill will

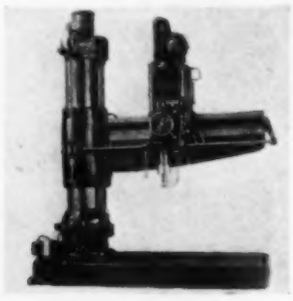


drill holes up to 1 in. diam. and 6 in. deep, the maximum and minimum distances between the center of the spindle and the column being 28 and 9 in. respectively. Six spindle speeds are available, the range being from 286 to 908 r.p.m., or from 475 to 1,500 r.p.m. Two feed rates are 0.008 in. and 0.012 in.

Drilling Machine, Radial 7-Ft.

G. Swift & Sons, Ltd., Halifax, England. [Vol.76,p.58E.]

Two motors are used on this radial drill, controls being by push-buttons on the saddle. No. 5 Morse spindle is 3¼ in. in driving part; vertical traverse, 20 in. Spindle speeds in 16

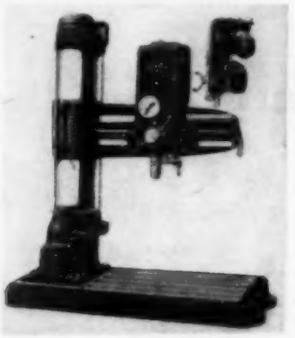


steps range from 20 to 600 r.p.m. Nine feeds vary from 0.064 to 0.033 in. Column is 18 in. The machine will drill 3¼ in. in cast iron; tap 2-in. Whitworth threads. Baseplate working surface is 7 ft. long by 3 ft. 6 in. wide. Maximum radius is 7 ft., minimum radius, 2 ft. 2 in.; vertical adjustment of arm, 3 ft.

Drilling Machine, Radial

United Machine Tool Co., Ltd., Gray's Inn Road, London, W.C., England. [Vol.76,p. 67E] 85.

The characteristics of this Hille (German) radial drill is the use of standard, replaceable



motors for the drive of the drilling spindle and vertical travel of the radial arm. The spindle motor is mounted on the back of the saddle so that the shortest power transmission is attained, while the motor for the vertical travel is mounted on top of the column. Spindle speeds range up to 2,200 r.p.m.

Drilling Machine, Radial

E. H. Jones (Machine Tools) Ltd., Baldwin Terrace, Islington, N., England. [Vol.76,p. 136E.] 131.

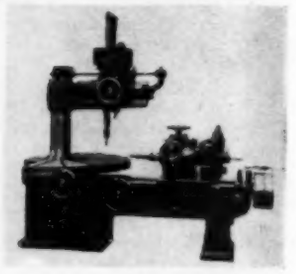
This radial drill made by Auerbach & Scheibe A.G., Dresden, has hand, semi-automatic and full automatic feed to the

spindle, and spindle speeds up to 6,000 r.p.m., or, with hand feed of spindle only, spindle speeds up to 12,000 r.p.m. It is intended to drill small holes up to ½ in. Maximum distance of the drill chuck from table is 21 in.

Drilling and Boring Machine, Radial and Horizontal

Ward, Haggas & Smith, Keighley, England. [Vol.76,p. 143E.] 135.

This combined radial drilling and boring machine is adapted for textile work known as calendar ends. A 7 ft. by 20 in. bed bears a pillar on which is mounted a fixed radial arm with the saddle adjustable 20 in. At the base of the pillar is a special T-slotted worktable which has two radii, 2 ft. 5 in. and 1 ft. 2½ in. Hand adjustment and a self-acting circular feed are provided to the table, together with an automatic stop.

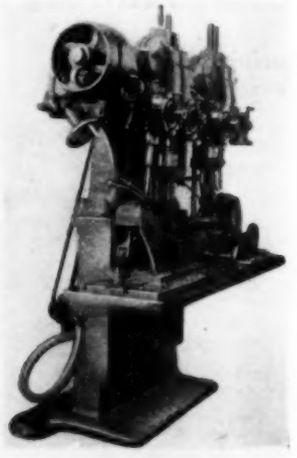


The horizontal boring head at the right is adjustable 22 in. along the bed.

Drilling Machine, Four-Spindle, Front-Axle

Adcock & Shipley, Leicester, England. [Vol.75,p.202E.] 6.

Main drive is by fast and loose pulleys. A motor platform is fitted at the back. Four saddles are provided. Two outer saddles can swivel from vertical up to 10 deg. for setting to the swivel-pin angle,



while the two inner saddles carry spindles fixed in the vertical plane, each spindle driving a five-spindle head for drilling the spring pad holes.

Drilling Machine, Boiler-Shell

Campbells & Hunter, Ltd., Leeds, England. [Vol.75,p. 276E.] 34.

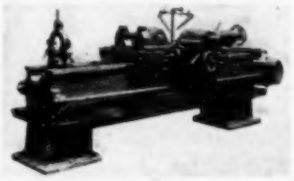
This motor-driven horizontal drilling machine is adapted for dealing with locomotive firebox casings and boiler shells. Of single-spindle type, it covers an area ranging from 3¼ to 15 ft. above the table top vertically, and 6 ft. on each side of the center line of the table horizontally. The column bed is 18 ft. long, by 4 ft. 9 in. wide, by 15 in. deep. The column has horizontal traverse along the bed of 12 ft. by power and by

hand. The table bed supports the 6½ ft. diam. worktable.

Drilling Machine, Slot, Horizontal, Duplex

J. Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.75,p.286E.] 37.

Keyseats and cotter holes up to 1½ in. wide are cut in shafts from 1 to 7 in. Maximum length admitted without overhanging the bed is 7 ft. Shafts

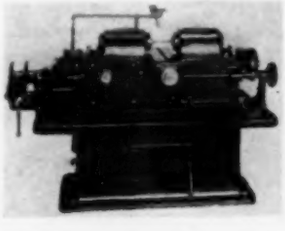


are held stationary, supported by a tailstock at one end and held in a self-centering vise at the other. The cutter head traverses along the bed at four rates, namely, 14.6 to 47.4 in. per min.

Drilling and Keyseating Machine, Slot

Carter & Wright, Halifax, England. [Vol.76,p.130E.] 128.

Keyways up to ½ in. wide by 3 in. long are drilled through 2 in. shaft on this horizontal machine. Worktable working surface is 18 in. long by 5½ in. wide, and is reciprocated by a disk and connecting rod. The two heads are mounted in line, are fed automatically and have quick automatic return. The maximum height of the spindle center above the table is 2½ in. Maximum and minimum distances between the spindle noses are 8½ in. and 2¼ in.



Reaming Machine, Horizontal, Duplex-Head

W. Asquith, Ltd., Halifax, England.. [Vol.76,p.93E] 112.

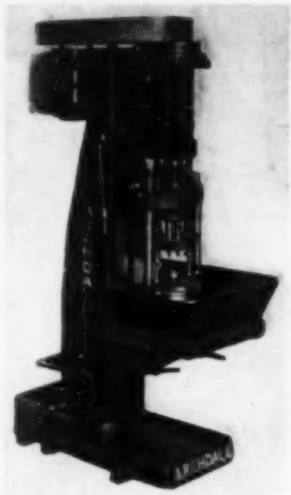
Reaming the main and camshaft bores in automobile cylinder blocks is the function of this unit. Each column has horizontal cross adjustment of 1 ft. 8 in. Two spindle speeds are 32 and 50 r.p.m.; two feeds, 16 and 20 cuts per in. Spindles

are bored No. 4 Morse taper. Maximum distance from the spindle to the center of the table is 3 ft. 6 in.; minimum distance, 2 ft. 2 in. Maximum height of spindle from top of table is 1 ft. 7 in.; minimum 2 in.

Drilling Unit, Automatic

J. Archdale & Co., Ltd., Birmingham, England. [Vol.76,p. 70E.] 92.

Self-contained standard units are available in five standard



sizes, by means of which special-purpose production machines may be built-up. These motor-driven units may be mounted in any position desired. Spindle drive is usually by means of spur reduction gears, and the feed motion is operated by a worm mounted on the spindle sleeve and wormwheel on a secondary shaft, the latter driving the camshaft by spur gearing. The cam provides quick forward and quick return motion.

Grinding Machines

Grinder, Universal

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.76,p. 49E.] 70.

Swing of 20 in. and 108 in. between centers are provided in this universal grinder. Taper ground is 7½ deg. included angle; grinding wheel 16 in.

diam. by 2 in. wide; and five steady-rests are applied. Three motors provide drive. Twelve rates of table traverse are obtained from a gearbox.

Grinder, Semi-Universal

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.76,p. 92E.] 110.

Both motors are controlled by one push button. The workhead can be swivelled for taper-grinding. The wheelheads for external and internal grinding are interchangeable and mounted on a non-swiveling base through

which cross adjustment is made. The machine has three-speed automatic table-traverse, stroke being adjustable by trips. Capacity is 8 by 16 in.

Grinder, Face, Duplex-Wheel

Dean, Smith & Grace, Ltd., Keighley, England. [Vol.76,p. 71E.] 93.

This two-wheel face grinder has a spindle mounted on ball bearings and a central drive by chain from a 1-hp. motor. At each end is an 8-in. cup wheel. At each side is a knee that carries a slide with micrometer adjustment of 2 in. to and from the wheel. Each 4-in. wide

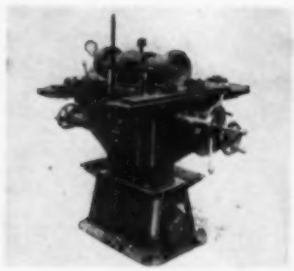
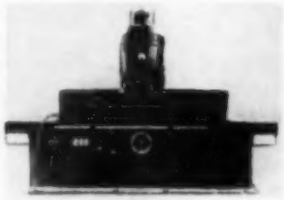


table may be traversed 2 ft. 3 in. Maximum height from the table to the wheel center is 8¾ in.

Grinder, Face

Billeter & Klunz, A.G., Aschersleben, Germany. [Vol. 76,p.79E.] 98.

An especially long table with hydraulic feed makes this face grinder suitable for grinding articles made in quantities, both rough blanks and milled and planed parts. The grinding

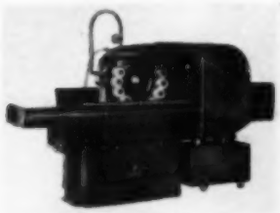


motor is built into the vertically sliding saddle which may be tilted to both sides. Table feed is effected by an hydraulic motor coupled direct to an electric motor, the range being from 20 to 240 in. per min.

Grinder, Face, All-Steel

Diskus-Werke, Frankfort-on-Main, Germany. [Vol.76,p.80E.]

All-steel construction is used in this face grinder for greater rigidity, increased resistance to wear, and economies in con-



struction. The machine has a 24 in. wheel and a grinding length on the worktable of 32 in. Feed is hydraulic.

Grinder for Two Adjoining Faces

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p. 253E.] 27.

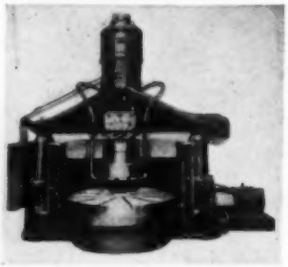
This special machine for

grinding two adjoining faces has a heavy wheelhead permanently angled at 45 deg., but has hand-operated feed adjustment at right angles to the table. It is used for simultaneously grinding diameter and face. Workpiece is mounted on an expanding arbor on a special live-spindle workhead, and grinding is carried out by feeding the table up to a dead stop.

Grinder, Surface, Rotary-Table

Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.105E.]

Built by the Lumsden Machine Co., Ltd., this heavy-duty surface grinder has a worktable of 60 in. in diam., capacity inside the water guards being 70 in. Minimum and maximum heights

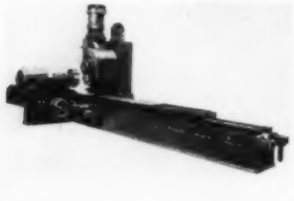


admitted are 0 and 18 in. A 63-in. magnetic chuck can be fitted and the maximum of height is then reduced to 14 in. Table speeds are 2½ to 10 r.p.m. and feeds are 0.003 in. to 0.03 in. per min. Feed of the wheelhead is brought about by a large ram.

Grinder, Surface, Triple-Wheel

John Lund, Ltd., Cross Hills, near Keighley, England. [Vol. 76,p.129E.] 127.

Work 18 ft. by 14 in. square can be ground in this surface grinder of three-wheel type. There are two side grinding heads and one vertical head. Speeds are 14, 18 and 20 ft.

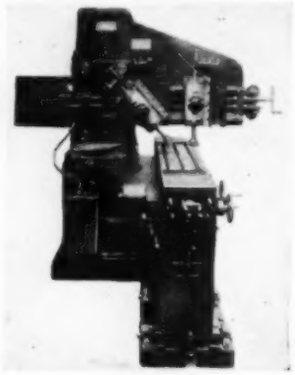


a min., with hand and automatic reverse. Wheel feeds are by hand. It is claimed that the machine will produce work parallel to within 0.002 in. in 18 ft.

Grinder, Machine-Bed

Billeter & Klunz A.G., Aschersleben, Germany. [Vol. 76,p.79E.] 89.

The arm carries two motorized spindles that may be tilted to all directions. The bed stands on adjustable wedges. Table feed is hydraulic, without steps,

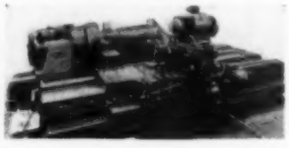


at rates of from 20 to 240 in. per minute. Uncovered parts of the bed guides are protected by folding guards. Control of the machine is effected from the front or rear.

Grinder, Roll, 40-In.

Craven Bros. (Manchester), Ltd., Reddish, near Stockport, England. [Vol.75,p.240E.] 21.

This machine grinds new rolls or regrinds used rolls up to 10 tons in weight. It will carry a 26-in. wheel and will then grind diameters of 4½ to 36 in., or with a 20-in. wheel rolls to 40-in. Maximum length of roll



admitted is 8 ft. and the length of bed is 18 ft. 6 in., but these can be extended. A cambering arrangement for concave and convex forms is fitted. Hand feed is provided.

Grinder, Rod

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.76,p.6E.]

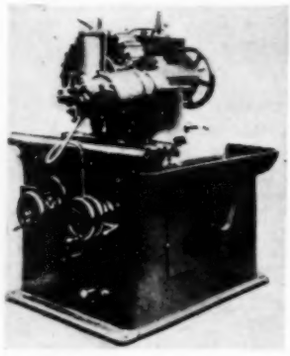
Continuous grinding of bars of circular cross-section to a maximum of 1½ in. diam. is provided by this machine. A three-point stay holds the rod in contact with the grinding wheel. The rod being ground passes from right to left with

continuous traverse effected by rotating rollers in the revolving workheads. All motions are driven by one 25-hp. motor.

Grinder, Cutter

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.76,p.91E.] 109.

Built by Collet & Engelhard, this grinder takes cutters from 4 to 16 in. and up to 28 in. special. It is automatic, includ-

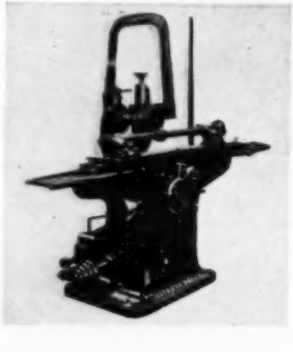


ing reciprocation of the motorized precision wheelhead and the indexing, and can be adjusted for 6 to 40 blades. Feed is continuous and is effected per blade, not per revolution of the cutter, the wheel wear being divided among the blades.

Grinder, Cutter, Universal

Jones & Shipman, Ltd., Leicester, England. [Vol.76,p. 131E.] 130.

A universal rising and falling wheelhead, a special workholder carrying an extended arbor, and a special tailstock on which cutters can be fitted for sharpening are found in this 36 in. by 8 in. universal grinder. Height of centers is 4 in., longitudinal

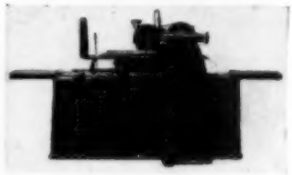


traverse, 36 in.; cross traverse, 6 in.; maximum and minimum distances from the wheel centers to table top, 14¼ in. and 3¾ in. The worktable swivels.

Grinder, Chaser and Die, Automatic

Atkins (Peterborough), Ltd., Old Fletton, Peterborough, England. [Vol.76,p.45E.] 65.

Capacity of this automatic grinder for threads of chasers and thread rolling dies is up to ¼ in. pitch, 3 ft. long, 4 in.

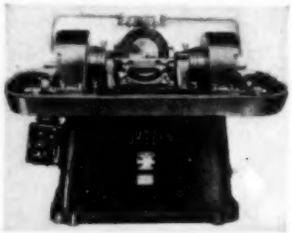


wide and 9 in. high. It will take eight tangential chasers tandem and the stroke can be adjusted from 0 to 36 in. Adjustment is also provided for centering the wheel in the grooves of the chaser. The principle is to grind a small amount from the threads in sequence, the machine dividing automatically from one thread to the next.

Grinder, Tool

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.201E.]

This special three-wheel machine has been introduced by Lumsden Machine Co., Ltd., Gateshead-on-Tyne, England, for grinding Widia-tipped tools. Two wheels are on the main



spindle and the third is driven from them by spiral gears. One wheel is for roughing, one for finishing and one for burnishing. Each wheelhead carries a cup wheel, the roughing and finishing wheels being 12 in. diam. by 6 in. wide, and the burnishing wheel 9½ in. diam. by 1½ in. wide.

Grinder, Tungsten-Carbide-Tool

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.45E.]

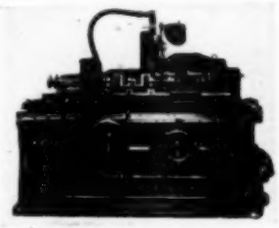
Three face-type grinding wheels used in this machine provide for roughing, rough-finishing and polishing tungsten-carbide tools. The machine is

made by B. R. Rowland & Co., Ltd., Reddish, Stockport. Each wheel has two rests adjustable for wear of the wheel and for angularity. Grinding wheels are 14 in. in diam. by 3 in. wide.

Grinder, Crankshaft-Journal

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.76,p.73E.] E97.

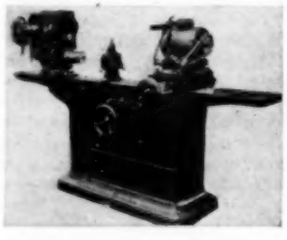
Capacity is 10x36 in. The shaft is carried between centers, and a steadyrest is placed against each pin, a spacing piece at the left-hand steadyrest locating the shaft longitudinally in relation to the spacing bar. The dial-reading sizing gage is carried on the hinged grinding wheel bracket. Control of the hydraulic wheelhead is similar to that of the pin machine.



Grinder, Internal, for Crankshafts

Jones-Shipman, Ltd., Leicester, England. [Vol.76,p.120E.] 124.

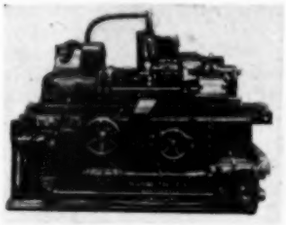
Both the workhead and wheelhead are driven by individual 1-hp. motors and the workhead swivels. Swing over the table is 12 in. and the capacity (length) using a short grinding spindle is 50 in. The table working surface is 66 x 6 in. It carries a three-point steady rest and has a traverse of 26 in. by hand.



Grinder, Crankpin

Churchill Machine Tool Co., Ltd., Broadheath, near Manchester, England. [Vol.76,p.72E.] 96.

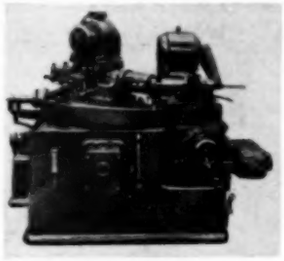
The shaft is held in throw blocks that are fixed as to throw. The machine has a four-speed traverse gear working in conjunction with an automatic feed and thus, with modification of equipment only, the pin grinder can also be used for ordinary plain grinding. The pin machine will swing 14 in. over the table and admit a crankshaft 28 in. long over-all.



Grinder, Spherical

Churchill Machine Tool Co., Ltd., Broadheath, Near Manchester, Eng. [Vol.76,p.117E.]

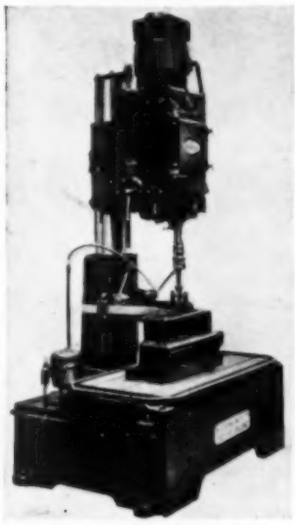
Two spherical grinders for external and internal purposes form a production unit on a universal joint sleeve. These grinders use a generating method and built on similar lines. Three motors are employed in the drive. The work piece is mounted on a live-spindle workhead which has a base pivoted directly below the center of the sphere to be ground, and while grinding is in progress the complete head is oscillated about this pivot point by an adjustable crank motion. On both units the speed can be set to operate automatically or by hand.



Honing Machine

Kitchen & Wade, Ltd., Halifax, England. [Vol.76,p.154E.] 139.

Holes from 1 to 6 in. in diam. up to 18 in. length are honed. Stroke can be adjusted from 0 to 11 in. Three spindle speeds vary from 320 to 180 r.p.m.; spindle cycles vary from 90 to 50 strokes per min. Maximum distance from spindle to table-top, 3 ft. 6 in., minimum distance 10 in.; distance from spindle to column face, 13½ in.



Honing Machine, Hydraulic

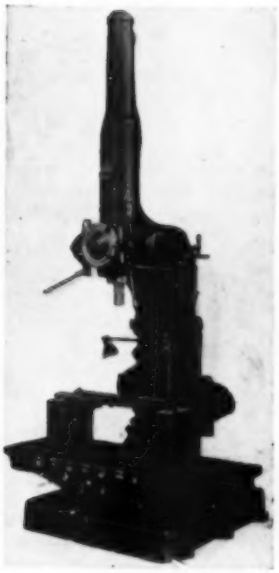
United Machine Tool Co., Ltd., Gray's Inn Road, London W.C., England. [Vol.76,p.67E.] 87.

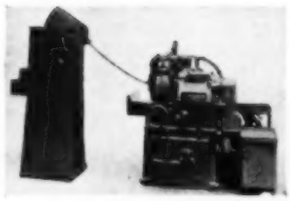
This Hille (German) machine has hydraulic feed, but the honing spindle, not the spindle saddle, is reciprocated vertically, thus giving high honing speeds. The control lever for the vertical motion is designed so that the machine may not only work fully automatically, but so that it is also possible to hone by hand on any desired portion. Feed is infinitely variable from 0 to 12 m. per min.

Hopper Feed for Centerless Grinders

Burton, Griffiths & Co., Ltd., Sparkbrook, Birmingham. [Vol.75,p.202E.] 7.

The hopper is of the oscillating-blade type. Speed of the work passing through the machine can be up to 12 ft. per min. and capacity is $\frac{1}{16}$ in. minimum to $\frac{3}{8}$ in. maximum diam., by $\frac{3}{4}$ in. minimum and 3½ in. maximum length. Built by B.S.A. Tools, Ltd.





Wheel Guard, "Clearview"

J. Broughton, Vere St., Birmingham, England. [Vol.76,p.19E.] 46.

A channel-section frame, felt-lined, fitted with Triplex plate glass is incorporated in this grinding wheel guard, which is 8x8 in. A sheet of ordinary plain glass below the Triplex plate is replaceable.

Lathes

Lathe, Center, 8¼-In.

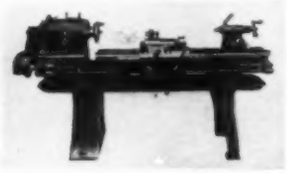
Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.7E.]

Manufactured by H. & A. Escher, Chemnitz, Germany, this 8¼-in. center by 9-ft. bed lathe swings 11¼ in. over the saddle. Twelve speeds range from 9.6 to 448 r.p.m. Eight feeds are available, as well as 36 Whitworth threads from 4 to 60 per in., and the same number of metric threads.

Lathe, All-Geared, 7-In.

Colchester Lathe Co., Hythe, near Colchester, England. [Vol.76,p.47E.] E68

Eight speeds in geometrical progression from 30 to 300 r.p.m. are provided. Swing over the saddle is 10 in. by 4 ft. between centers. With the half-

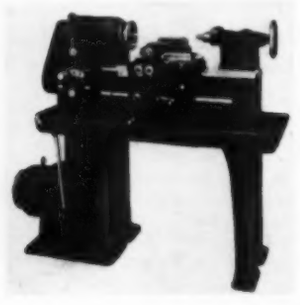


gap piece removed, work 21 in. diam. by 5 in. in front of the faceplate can be turned. A two-speed gearbox is provided, 24 Whitworth threads from 3½ to 48 per in. being provided, and 24 feeds at three times these rates. The machine may be driven by a 1¼-hp. motor connected by chain to a pulley incorporating a clutch at the base. The spindle is of high-carbon steel and is bored 1 5/16 in. right through. The loose head is adjustable for taper turning and may have a quick locking device. On the apron the controls are interlocked.

Lathe, Production, Short-Bed

G. H. Alexander Machinery, Ltd., Birmingham, England. [Vol.76,p.67E.] 88.

This short-bed production lathe is built by Ludwig Loewe & Co., Berlin. It has 5½-in. height of centers, and is especially intended for turning short pieces up to 11 7/8 in. long of

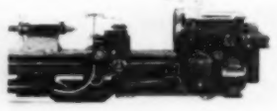


small diameter. Sliding, surfacing or turning at an angle can be done on both carriages simultaneously. It is thus adapted to quantity-production machining of bolts, finishing intricate and plain parts, such as previously roughed on automatics and for machining light metals at high speeds. With a one-, two-, or three-speed motor, either three, six or nine spindle speeds from 190 to 3,000 r.p.m. may be obtained. Drive from the motor to the headstock is by an endless woven silk belt to reduce vibration at high speeds.

Lathe, All-Geared, 15-In.

G. Swift & Sons, Ltd., Halifax, England. [Vol.76,p.118E.]

Texrope drive is used on these lathes built in bed lengths from 12 to 33 ft. 6 in. Push-button control is located on the headstock and the saddle. The all-geared headstock has 18 spindle speeds from 2.5 to 210 r.p.m. On the 18-ft. bed ma-

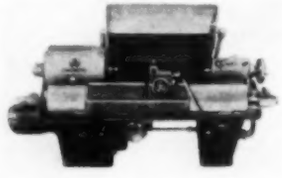


chine the spindle has a 5 in. hole for bar work. Six rates of feed give from 10 to 52 cuts per in. The loose headstock sets over for taper turning, and a pawl engages with a rack down the center of the bed, for taking the thrust when heavy work is being machined between centers. At the rear is a 15-hp. motor mounted on rails to keep the Texropes at proper tension. Reversible quick power traverse to the saddle at 36 ft. per min. is furnished by an independent motor mounted at the rear of the saddle. Floor space is 20 ft. 6 in. long by 5 ft. 6 in. wide.

Lathe, High-Speed

Dowding & Dickinson, Greycoat St., Westminster, S. W. England. [Vol.76,p.125E.] 126.

Magdeburger Werkzeugmaschinenfabrik A. G. Magdeburg, developed a "flowing-chip" lathe of unusual design, in which the cutting tool points downward and the bed is of triangular section and slopes to the rear to guide the chip into a conveyor



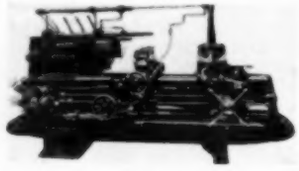
under the machine. The spindle is driven by a flange motor through cone pulley, at speeds from 750 to 6,000 r.p.m. The saddle is driven hydraulically independently of the spindle. Principal dimensions are: maximum diam. turned, 4 in.; maximum swing, 6 in.; maximum distance between centers, 19½ in. The hydraulic feed range is from 0.0004 to 0.02 in. per rev., with quick travel in each direction at 7 and 10 ft. per min.

The cone pulley is carried independently of the spindle and drives through a flexible coupling. The tailstock carries a live center running in roller bearings, and a machined surface accommodates auxiliary cutting-off slides. On the right-hand cabinet leg is a lever which controls the feed, quick travel in each direction, and stop. A dial connected to the stroke adjustment of the hydraulic pump permits independent change of feed over the complete range. In the oil circuit of the hydraulic circuit is a valve which is released immediately when the saddle encounters more than a predetermined resistance.

Lathe, Turret

H. W. Ward & Co., Ltd., Birmingham, England. [Vol.76, p.26E.] 53.

Based on earlier models of the same capacity, these combination turret lathes, Nos. 7 and 10, are almost identical. They are more powerful than earlier models, have completely covered beds, and have an automatic lubrication system.



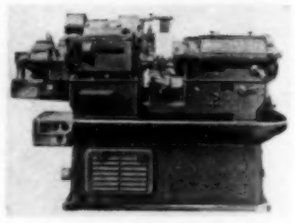
Tungsten-carbide tools may be used. The No. 7 machine has an 8¾ in. height of center; the No. 10 12½ in. The first will swing 16 in.; the second, 23 in. Other specifications of No. 7 machine (those for No. 10 given in brackets): 9 in. (15½ in.) with chuck over the cross-slide; 12 in. (15 in.) with chuck up to the end of the cross-slide; hole through spindle, 2⅜ in. (4⅛ in.); eight (16) spindle speeds in two ranges, 25 to 536 r.p.m. (11 to 380 r.p.m.) with gunmetal bearings—50 to 1,000 r.p.m. (20 to 578 r.p.m.) with ball and roller bearings on spindle; ten feeds, 13 to 270 cuts per in. (11 to 246 cuts per in.)

The bed is of the flat type and has narrow guides. A pump in each saddle provides automatic lubrication for the bed. This feature, combined with the stainless steel, channel-shaped bed cover, minimizes wear on the ways. Saddles carry felt wipers, and there are no projections over the ends of the bed. In the saddle are cored slots through which the covers pass, and thus movement of each saddle is permitted along the bed. The front cover carries a rule and the turret saddle an adjustable pointer, these being of use to the operator when setting up or making single pieces.

Lathes, Turret, Automatic

United Machine Tool Co., Ltd., Gray's Inn Rd., London, W.C., England. [Vol.76,p.55E.]

Working on the one-cam system, this lathe has a turret arranged for five tools. All move-

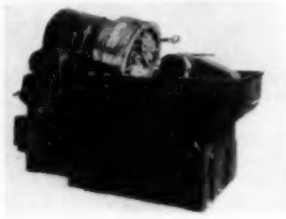


ments are derived from a single pulley. Eight spindle speeds, forward and reverse, are obtained through change gears. Special attachments are driven by chain from the interior of the lathe. The gears driving the headstock spindle are of the worm type to assure smooth cutting. The drive of the rear camshaft is by chain, intermediate shaft, spur and bevel gears. The turret lathe is built by Pittler Werkseug Maschinenfabrik, A.G., Leipzig.

Automatic, Four-Tool

G. H. Alexander Machinery, Ltd., Birmingham, England. [Vol.76,p.68E.]. 90.

Built by Ludwig Loewe & Co., Berlin. Pieces are turned over their length by four tools working simultaneously, and using relatively heavy feeds. The machine will take black-rolled bars up to 2¾ diameter. Maximum



length of feed is 11 13/16 in.; turning length when forming, 7 3/32 in., or with special toolholders up to 10⅜ in. Maximum thread cut with rotating diehead is 1 in. Spindle speeds range from 100 to 700 r.p.m., in ten steps. The machine can also be used as a semi-automatic on pressed parts or parts cut to length made in two operations, the turret then being replaced by a simple tool slide.

The lathe will absorb up to 40 hp., the efficiency claimed being 85 per cent. The latter is due to the short transmission and the use of roller bearings.

The four cross-slides are arranged around the work spindle and a cam drum rotates around these and, by means of four cams on the inside circumference, moves the cross-slides simultaneously toward the center. Of the four cutting blades, two, which are in advance, are toothed and the others, which give the finishing cuts, are plain. Towards the end of the forming movement the blades run out into a very fine feed for finishing purposes by the plain blades. Total life of a set of blades is claimed to be between

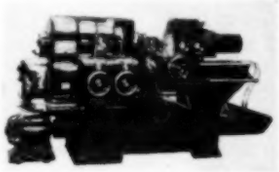
25,000 and 30,000 pieces of work.

For feeding purposes the bar moves forward by its own weight, due to the inclined position of the headstock. The bar guiding device pivots so that the stock can be placed in a horizontal position on the guide rails, and when inclined can readily be introduced into the spindle or withdrawn by crank. The turret slide has rack and pinion feed controlled by cams on the outside of the drum. It is indexed by a Geneva stop device controlled by an adjustable dog. It can be replaced with a toolslide with turning tools. Two pieces can be turned simultaneously.

Lathe, Automatic, for Pistons

Benrath Machine Tools, Manchester, England. [Vol.76,p. 95E.] 114.

Built by Gebr. Heinemann, St. Georgen, Black Forest, Germany, this automatic multi-tool lathe for aluminum pistons has a magnetic clutch. Feed of the tools on the longitudinal



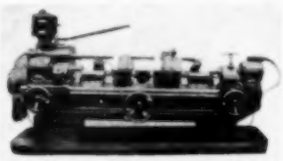
carriage to the cutting position is obtained by hydraulic means. The back center is advanced by compressed air. Chucking is done by hand; machining is automatic. Feeds in 32 steps can be obtained, ranging from 0.0008 to 0.06 in. The firm's magazine attachment is not used because the short cutting time makes necessary the constant attention of the operator. Selected taper roller bearings with adjustment for wear support the spindle.

Automatic feed is derived from the main spindle through spur gears. For each carriage one graduated cam disk is provided. Adjustable dogs disengage the feed and engage the quick return motion at any desired point. The ratio between the travel of the longitudinal and the cross-slide can be altered by means of two pairs of pick-off gears. Drive to the machine is obtained from a 10-hp. variable-speed d.c. motor with belt and jockey pulley.

Centering Machine

Craven Bros. (Manchester), Ltd., Reddish, Stockport, England. [Vol.76,p.5E.] 41.

Suitable also for turning and facing the ends of shafts or tubes, this centering machine is available in two sizes, heights of centers being 7 and 9 in., to admit 4¾-in. by 4-ft. shafts to 6-in. by 5-ft. shafts. If used for turning and facing, the drill-heads are replaced by normal

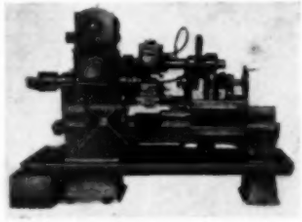


front-turning tool-slides, with multiple cutting tools. In the standard machine a narrow center driving head is used with one revolving stay. Drive may be by flanged motor or pulley, with friction clutch for starting and brake for stopping. Three spindle speeds are provided. The revolving stay and the center driving head can be adjusted along the bed by rack and pinion. Saddles, which carry the centering headstocks, can be traversed separately or simultaneously. Feed motion of the front and rear slides may be either semi-automatic with quick power return or provided with normal cutting traverses.

Lathe, Multi-Cut

Smallpeice, Ltd., Foleshill Road, Coventry, England. [Vol. 76,p.175E.] 150.

This lathe is developed for turning the fins and the exteriors of aeroplane engine cylinders. A differential feed principle is used by which roughing and finishing cuts are

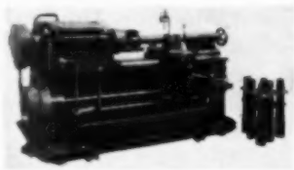


taken simultaneously, the finishing tools having a slightly quicker feed, so that, starting later, they overtake the roughing tools. The machines are built on the unit principle. They can also be supplied as central drive machines, or with headstocks at each end for driving from both ends. They are available to swing 12, 18 and 24 in., with lengths of bed to meet requirements. C. Churchill & Co., Ltd., Albert St., Birmingham, England, is the selling agent.

Lathe, Single-Purpose, 16-In.

C. Redman & Sons, Ltd., Halifax, England. [Vol.76,p. 186E.] 155.

This 16-in. lathe is built for turning ends of steel axle housings on a straight portion, 3¼ in. diam. by 4½ in. long. About 40



pieces are machined per hour at cutting speed of 180 ft. per min. Tungsten carbide tools are used. All spindles run in Timken bearings. The machine takes 10 hp. In order to permit quick and easy changing of the pick-off gears, the driving pulley is carried at the rear on ball and roller bearings. Speeds ranging from 40 to 600 r.p.m. can be obtained. The saddle bears a platen cross-slide having hand adjustment and an adjustable stop for sizing.

Cut-Off Slide for Automatics

A. Butterworth & Co., Rochdale, England. [Vol.76,p.142.]

This independent cut-off slide, which can be applied to all Butterworth automatics, is bolted to the standard machined seating on top of the headstock.

The toolpost used is reversible so that by inverting it and inserting the blade at the other end, the attachment can be used for reverse cutting. Necessary motion is taken from a cam which can be adjusted around the main camshaft to any position required.

Rod-Feeding Attachment

Leo C. Steinle, Ltd., Marsham St., London, S.W., England. [Vol.76,p.125E.] 125.

Hahn & Kolb, Esslingen, Germany, have developed an automatic rod-feeding attachment for the Index OR, 12 and 18, automatics, for rod lengths up to 11¼ ft. The new rod is

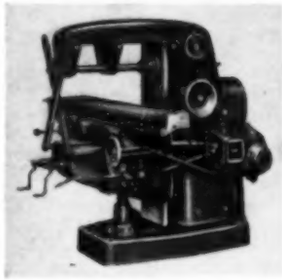
fed against the remaining part of the last one by the action of a weight. When the stub is ejected a stop is automatically swung out of the way and the new rod passes through the feed collet and chuck, thus allowing the cutting-off tool to square the front end of the rod and enabling the other tools after feeding to continue operations without stopping the machine. Noiseless feed tubes, also brought out, have a steel spiral spring for the full length to deaden the hammering effect of the rotating bars.

Milling Machines

Milling Machine, Knee-Type

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.90E.] 105.

Built by Wanderer-Werke A. G., Schonau-bei-Chemnitz, this knee-type milling machine has been improved in that the change-over from feed to rapid

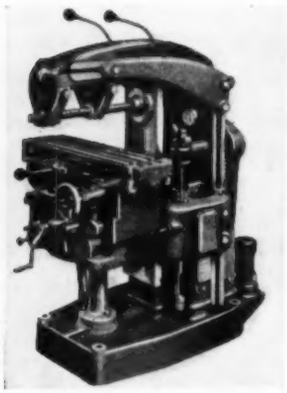


traverse or vice-versa is effected either automatically by means of stops located on the table or manually. The 12 different feeds are obtained either by hand-wheel on the cross-slide or by push button. The feed and also the direction of working can be read off direct on an illuminated aperture, and thus operation of the machine is considerably facilitated.

Milling Machine, Knee-Type

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.90E.] 107.

Built by Wanderer-Werke A.G., Schonau-bei-Chemnitz, in this machine it is claimed that the special design of the overhanging arm and its lateral support by means of two arms insures absorption of the cutting pressures. The table is always readily accessible. Single lever operation is embodied. Spindle speeds range from 48 to 2,100 r.p.m. for use of tungsten carbide. The table is also supported on both sides by two arms provided with surfaces that slide on the standard, and

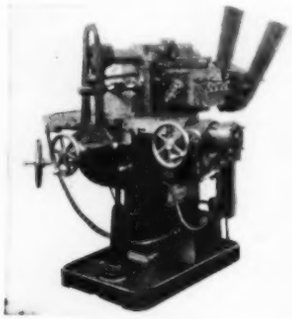


if necessary these arms can be clamped. With the spindle speeds mentioned it is possible to use the smallest cutter, and the necessary speeds are available for machining light metal or for using tungsten-carbide tools.

Milling Machine, Semi-Manufacturing

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.191E.] 3.

This semi-manufacturing milling machine is intended to take a place between a plain and fully automatic type, and is actually a modification of the company's No. 33 plain miller. It has automatic longitudinal feed of



21 in., a transverse adjustment of 6 in. and a vertical adjustment of 16 in., working surface of the table being 38¾ by 10½ in. Eight spindle speeds range from 52 to 700 r.p.m. and feeds range from 1¾ to 17 in. per min.

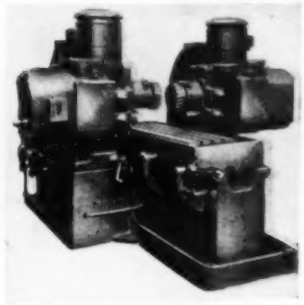
The machine has an electrically operated automatic quick return to the table as an additional feature. The rate of return is 100 in. per min. The table is brought to rest by an adjustable stop that trips a limit switch controlling the quick-return motor. The table may be stopped manually at any position.

The motor for the table quick-return motion is a small constant-speed type and is mounted at the right-hand end of the table. The operator is relieved of most of the winding back of the table by hand and thus can attend to two or more machines.

Milling Machine, Duplex, Hydraulic

J. Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.76,p.184E.] 153.

Hydraulic automatic feed and quick traverse motions are used on this duplex automatic horizontal milling machine, which employs separate motors for each spindle. Spindle speeds range from 20 to 160 r.p.m.



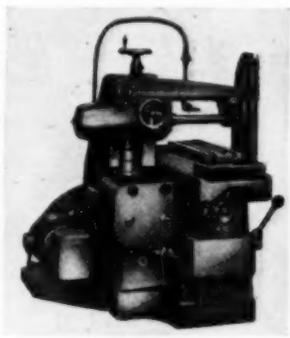
Heads have vertical adjustment by hand, maximum and minimum distances from the table to spindle center being 20 and 10 in., while maximum and minimum distances between spindle noses are 22 in. and 6 in. Each head can be fitted with one or two spindles. The bed is of box section and carries a table which has a working surface of 16 by 54 in., the traverse being 48 in. Horizontal adjustment to each spindle is obtained by a sleeve actuated by a rack and worm, and each spindle can be locked. Spindle noses are bored to a special "non-stick" taper. All changes of the table movement are centralized in a single hydraulic valve. Net weight of the machine is 5½ tons.

The hydraulic pump unit comprises a variable-delivery high-pressure pump of 550 cu.in. capacity and 1,000 lb. per sq.in. pressure, and a duplex gear pump of 5,000 cu.in. capacity and 300 lb. per sq.in. pressure, running at 860 r.p.m. The control can be set to engage automatically the table feed or rapid motion as required. When feeding, the high-pressure pump is in operation, and when the table is travelling at the fast rate the large volume of oil required is furnished by the low-pressure pump.

Milling Machine, Lincoln-Type

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.89E.]

Built by Wanderer-Werke A.G., Schonau - bei - Chimnitz, this semi-automatic Lincoln-type milling machine has been simplified as regards operation, so that only a single lever is required for feed, rapid traverse, spindle rotation and coolant supply. Table traverse is always 10 in irrespective of the

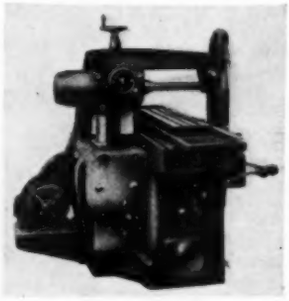


cutting length. This involves little loss of time as by means of the adjustable feed cams on the control disk, mounted on the same shaft as the cam drum for driving the table, the table traverse can be regulated in such a manner that only the cutting traverse necessary for the work piece (50 mm.) is travelled at the required speed of feed, the remaining 200 mm. being traversed at accelerated speed. The idle travel, even with a relatively short work piece, only occupies a few seconds.

Milling Machine, Semi-Automatic

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.89E.] 104.

Built by Wanderer-Werke A.G., Schonau - bei - Chemnitz, this semi-automatic surface milling machine has table traverse

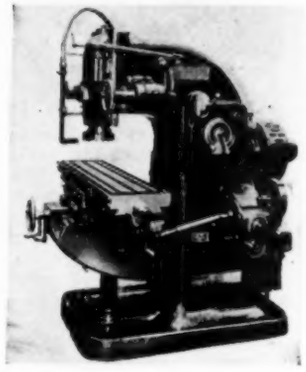


effected by a screw, the cutting stroke being 500 mm. Automatic control of feed, accelerated movement, cutting spindle rotation and coolant supply is effected by stops on the table and also by moving a single lever. The cutter spindle rotation and the coolant supply are engaged simultaneously on engaging the feed or rapid return movement. The overhanging arm can readily be swung back into a recess in the bed to give free access to the table.

Milling Machine, Vertical

Cunliffe & Croom, Ltd., Manchester, England. [Vol.75,p.212E.] 8.

This machine has a table with a working surface 51 in. by 13½ in., automatic longitudinal and cross traverses of 36 and 13 in. and vertical adjustment by hand of 18 in. Eighteen spindle speeds are provided in geometric progression from 18 to 432 r.p.m. Maximum distance from spindle to table is 19 in.; from

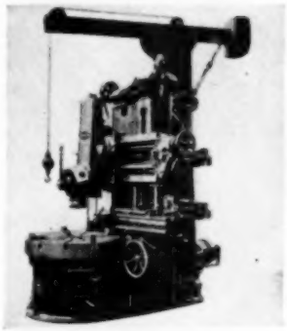


center of spindle to column, 16 in. Eighteen feeds from ¾ to 12 in. per min. are provided. A 16-in. table may be had. Drive can be furnished by means of a pulley or 7½-hp. motor, and the latter can be fitted at any time on the standard facings provided at the side of the base. All speed gear driving shafts have ball or roller bearings. Automatic flood lubrication is provided for all driving and feed gears. The spindle has the standard non-stick taper. Adjustment of 6 in. is given to the counterbalanced spindle head, and it has quick and slow hand motion. A lock is provided for the slide. The feedbox is built to drive the 16-in. circular table with a full range of reversible feeds, which can be tripped at any point. When the worm motion is disengaged, the table can be revolved by hand. Coolant is provided by a gear-driven pump, and bypass and safety check valves are fitted. Fitting into the body of the machine is the large coolant tank, which can be withdrawn quickly for cleaning purposes. Net weight of the machine is about 5,500 lb. An adjustable micrometer depth stop is fitted at one side of the head.

Mill, Vertical

George Richards & Co., Ltd., Broadheath, near Manchester, England. [Vol.75,p.287E.] 40.

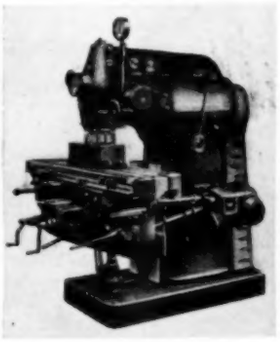
This 48-in. vertical boring and turning mill is arranged with a crane. Control is centralized and both vertical and side heads have eight automatic feeds, vertical and horizontal, each head having its own feed box. Machine will admit work 50 in. diam. by 48 in. deep under the turret or 36 in. under the cross-slide, vertical movement of the turret being 30 in. and horizontal movement from center 27½ in. The crane facilitates loading and unloading heavy, bulky pieces.



Milling Machine, Vertical, Hydraulic

A. C. Wickman, Ltd., Coventry, England. [Vol.76,p.90E.]

Spindle speed can be adjusted hydraulically over a range of from 20 to 1,000 r.p.m. Transmission to the cutter spindle is effected through two pairs of

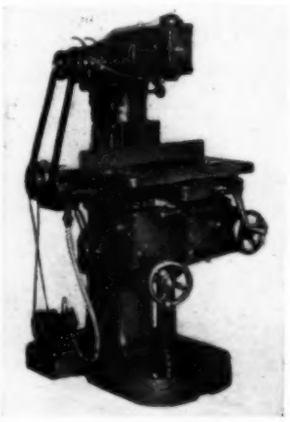


gears to give steady running. A pressure gage indicates cutting capacity of the tools. The machine is suited to machining light metal and for the use of tungsten carbide.

Milling Machines, Vertical-Edge, Automatic

J. Archdale & Co., Ltd., Birmingham, England. [Vol.76,p.172E.] 145.

For milling slots or grooves of special shape, these automatic vertical edge milling machines are built with a fixed head and



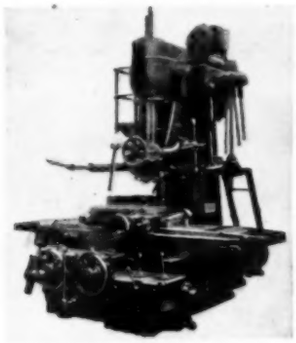
with a swiveling head, respectively. The table has working surface of 17 by 9 in. with hand adjustment of 3 in. longitudinally, 2 in. transversely and 9 in. vertically. Maximum distance between the spindle nose and the table is 12 in. Spindle speeds range from 525 to 1,460 r.p.m.

The work is moved in relation to the cutter spindle in a rectangular path variable from 2 in. by 1 in. down to ¼ in. by ¼ in. By special cams similar trapezoidal paths may be covered. Cams provide the cutting feed.

Milling Machine, Vertical

Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.183E.] 151.

On the No. 48 vertical miller, a six-splined spindle and a special bearing system are now used. Longitudinal feed is 73

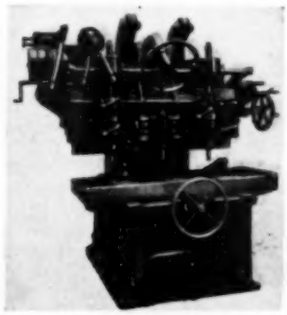


in.; transverse feed, 33 in.; maximum distance from the table to the spindle, 29 in.; vertical adjustment of spindle head, 21 in.; column to the center of the spindle, 26¾ in.; working surface of the table, 96 by 24 in. The circular table is removable.

Milling Machine, Profile

Holroyd & Co., Ltd., Milnrow, near Rochdale, England. [Vol.76,p.130E.] 129.

Profile milling the backs of steel blades of torpedo propellers up to 24 in. diam. by 4 in. width of blade is done on this machine, two being done at once. The two cutter spindles are at fixed centers on a slide which has vertical adjustment



on the saddle. The tracer pin is carried centrally on the cutter-head slide and has a short independent cross adjustment for setting.

Milling Machine, Profile

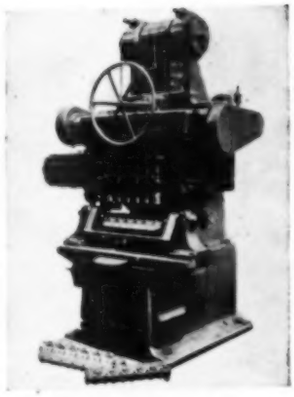
J. Holroyd & Co., Ltd., Milnrow, England. [Vol.76,p.171E.] 143.

Milling the combustion chambers of automobile cylinder heads, these chambers being radial at the bottom, is the function of this profile miller. Six spindles are driven by two long worms at the top of the machine with which alternate spindles engage. Spindles are independently adjustable for center distance, the minimum being 3¾ in. To obtain the required profile the cutters move across the machine in definite relation to the movement of the workjig, the motions being controlled by cams.

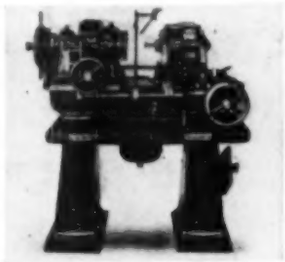
Milling Machine, Thread

G. Moulton, Ltd., Collyhurst, Manchester, England. [Vol.76, p.71E.] E95.

This thread miller is for internal threads up to 5¼ in. and external threads up to 6 in., the maximum length of thread, depending on the pitch and mate-



rial, being 2 in. The complete thread is finished in a single revolution of the work. Threads can be cut right up to the shoulder or to the bottom of a blind hole, and one operator can attend to two or more machines.



Presses

Press, Automatic, Positive-Feed

Hunton, Ltd., Euston Road, London, N.W., England. [Vol. 76,p.118E.] 123.

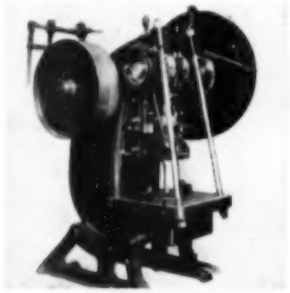
The Weingarten eccentric press is fitted with a new automatic feed by which the strip is held by twin grips and is fed forward positively at every stroke. The mechanism is driven from the eccentric shaft through

gearing and a vertical shaft. Presses are built in five sizes ranging from 30 to 150 tons. The smallest admits 19¼ in. and distance between the ram and table is 9¾ in. The largest admits 4 ft. 10½ in. and distance between the ram and table is 16½ in.

Presses, Adjustable-Stroke

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.237E.] 16.

Built by Hordern, Mason & Edwards, Ltd., Birmingham, adjustable-stroke power presses are available in four sizes vary-



ing from 12- to 70-tons. With the exception of the 12-ton size, all are available either geared or ungeared. Ten variations of stroke are available in the 12-ton machine from ⅜ to 2¾ in.

Press, Blanking

Henry Pels & Co., Berlin, Germany. [Vol.76,p.55E.] 76.

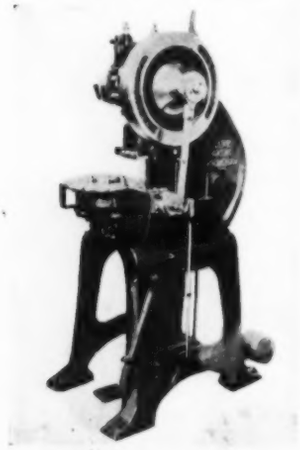
This blanking press operates at 120 strokes per min. on brass and aluminum stampings. The

tilting toggle, with the aid of a pneumatic control, allows instantaneous engagement and stoppage of the tup.

Press, Dial-Feed

Taylor & Challen, Ltd., Birmingham, England. [Vol.76,p. 35E.] 58.

Blanks or articles to be pressed are placed in position by the carrier plate. A top extractor replaces the pressed article in the carrier during up-stroke of the slide. The plate then moves on, and finally

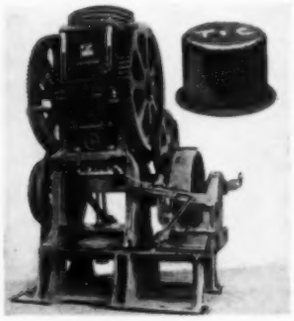


drops the component down a chute at the side. Components as deep as 1 1/16 in. can be drawn through the die, tapered, or formed, with a 4-in. stroke. Speeds up to 90 strokes per min. are available.

Press, Drawing, Toggle

Taylor & Challen, Ltd., Birmingham, England. [Vol.76,p. 21E.] E52.

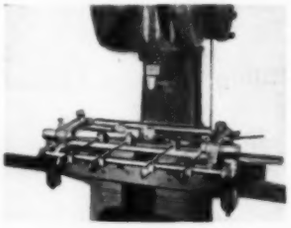
A central support on the crankshaft enabling the press to "bottom" is a feature. Weighing approximately 24 tons and driven by a 35-hp. motor, it makes 5½ strokes per min. It is operated by friction clutch, and by means of hand levers can be stopped at any part of the stroke for tool-setting.



Presses, Straightening

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.263E.] 29.

Exceptionally flexible control is claimed for these straightening presses made by Carl Hurth, Munich, Germany. They are used for straightening, bend-

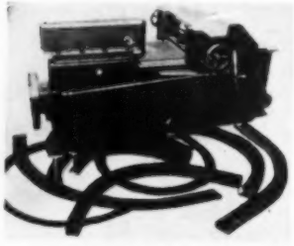


ing, broaching and burnishing holes, cold riveting, and in certain assembling operations, including pressing-in bushings and bearing races, and forcing gears on to shafts. Two sizes afford pressures of 3 and 8 tons.

Press, Straightening and Bending

Henry Pels & Co., Berlin, Germany. [Vol.76,p.56E.] 77.

T- and U-sections are straightened or bent on this press which has independent driving gear with levers linked to the tup and the abutments. This lever



gear consists of two levers, the pivoting centers of which are linked by a rod. Top ends of the levers impart motion to a pressure rod fastened to the tup and the base of the abutments.

Press Guard, Fixed

J. P. Udal, Upper Dean St., Birmingham, England. [Vol. 76,p.21E.] 51.

In this guard for blanking operations. A vertically adjustable safety glass panel can be set so that a space is left between the underside of the panel

and the bed of the press for feeding strip from back to front and gives a clear view of the work.

Press Guard

J. P. Udal, Upper Dean St., Birmingham, England. [Vol. 76,p.38E.] 63.

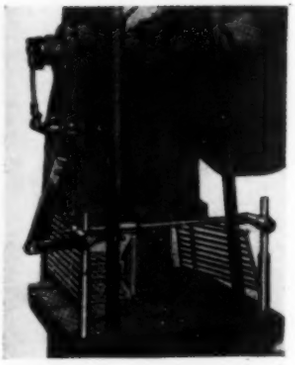
Specially designed for large presses with long strokes, this automatic guard consists of a single swinging frame mounted

on the slide of the press, and therefore, in addition to its own downward and outward movements, travels downward by the amount of the press stroke.

Press Guard, Side-to-Side

J. Broughton, Vere St., Birmingham, England. [Vol.76,p. 57E.] 79.

This guard is worked through a crank on the end of the press



shaft, which drives through flexible knuckle joints to a crankshaft housed in the action body. The front end of the crankshaft is attached to an adjustable lever arm holder which, together with the link, forces the shutter across the danger zone of the press, in advance of the tool. A side guard is fitted at the right.

Press Guard, Long-Pull

J. P. Udal, Upper Dean St., Birmingham, England. [Vol. 76,p.105E.] 118.

The improved press guard has the outer frame wider than the tie-rods, and inner frame swings between the rods and is driven from a lever pinned to an overhung extension of the support shaft for the inner frame. Full width between the rods is left for the operator to get the work in or out.

Other Machines

Gear-Cutting Fixture, Internal, Maag

Sulzer Bros., 31 Bedford Square, London, W.C., England. [Vol.76,p.57E.] E78.

The fixture is applied by fitting a rack to the existing cutter head, and facing, drilling and tapping two bosses on the cutter slide to hold the fixture body. The Fellows principle is employed, but with the difference that the cutter itself moves away from the gear for relief on the idle stroke and not the

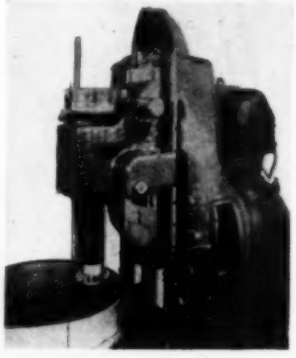
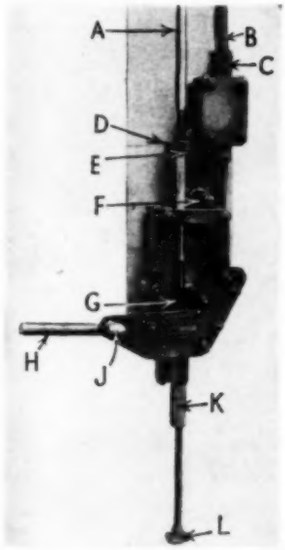


table. Fixtures are available for the 20-in., 30-in., 40-in., and 6-ft. machines.

Drop Stamp, Friction, Automatic

B. & S. Massey, Ltd., Openshaw, Manchester, England. [Vol.76,p.141E.] 132.

This apparatus operates friction drop stamps automatically and can be fitted to new or existing machines, particularly of 20 cwt. size or less. The apparatus actuates the pulling

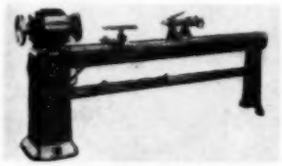


cord of the stamp, and it consists essentially of a simple toggle gear which is put into action by a trip rod *A* which reproduces on a very small scale the actual movements of the tup. Length of stroke is adjusted by sleeve *K*.

Lathe, Wood-Turning

Wilson Bros., Ltd., Leeds, England. [Vol.76,p.106E.] 119.

This 8-in. lathe for pattern-makers has a bed 8 ft. long by 7 in. wide and admits work 5 ft. 9 in. It has a standard



lathe spindle bored No. 3 Morse taper, with a threaded nose to take faceplates and chucks. Spindle speeds are 500, 1,000, 1,500 and 3,000 r.p.m.

Lathes, Wood-Turning

Wadkin & Co., Leicester, England. [Vol.75,p.249E.] 22.

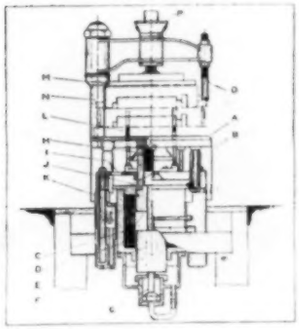
Two sizes are 12 in. and 15 in. centers. Drive is by 3-hp. motor. Nine spindle speeds range from 98 to 1,904 r.p.m. The spindle is threaded to take an 18-in. faceplate. Both 12 and 15-in. machines will take

8 ft. 3 in. between centers with the bed close up to the headstock. On the smaller machine 5½ ft. can be worked on the inner faceplate and 6 ft. on the larger machine.

Molding Machine, Squeeze, Magnetic

Pneulec, Ltd., Smethwick, near Birmingham, England. [Vol.75,p.251E.] 25.

Built by British Insulated Cables, Ltd., Prescot, and distributed by the above company in Great Britain, this molding machine is of the electro-mag-

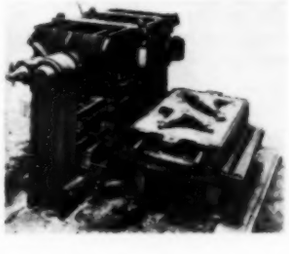


netic squeeze strip type. Pattern draw is by gravity on the down stroke. These magnetic machines are adaptable for use on plain squeeze, squeeze strip, downsand frame squeeze and downsand frame squeeze stripping-plate work.

Molding Machine, Magnetic, Rollover

Pneulec, Ltd., Smethwick, England. [Vol.76,p.59E.] E83.

This rollover squeeze strip magnetic molder will accommodate boxes up to a maximum area of 486 sq.in. The machine is rolled over before squeezing, and the strip is made on the down-stroke. Rolling-over is

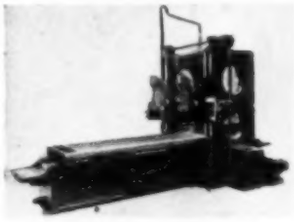


done by hand, the machine being balanced. A gravity roll-off conveyor takes the mold automatically.

Planer, Motorized

Butler Machine Tool Co., Ltd., Halifax, England. [Vol. 76,p.174E.] 149.

This high-production planer has a spiral gear drive and electric motor feed, the size shown being to plane work up to 8 ft. long by 3 ft. 6 in. square. The

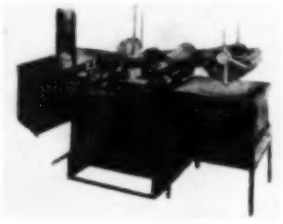


new feature is the rectangular-shaped standard with cross rails back and front. Range of cutting speeds is from 20 to 140 ft. per min. and return speeds from 75 to 150 ft. per min.

Plating Machine, Chromium

W. Canning & Co., Ltd., Birmingham, England. [Vol.76,p. 18E.] 47.

This machine handles screws, rivets and similar small goods which will roll. They are placed in the cradle which is supported on counter-balanced arms and,

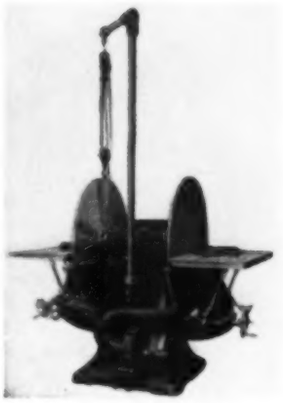


after loading, lowered into the plating vat and given a slow rocking motion through a motor-driven lever. After plating the cradle is swung into the rinse tank.

Sanding Machine, Double-Disk

Wadkin & Co., Leicester, England. [Vol.75,p.276E.] 33.

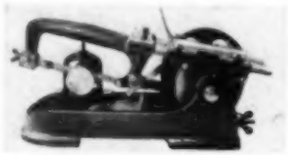
Sanders of 30- and 36-in. sizes have been added to this company's manufacture. Worktable tilt to 45 deg. below and 10 deg. above the horizontal. Thus bevelled edges of any angle can be obtained. The sander can be supplied either fast pulley or belt-driven. The smaller machine has worktables measuring 34 by 17 in.; the larger 40 by 19 in.



Hacksawing Machine

E. G. Herbert, Ltd., Levenshulme, Manchester, England. [Vol.76,p.35E.] 57.

Capacity of this "Rapidor" machine is 3x3 in., and it may be bolted to a bench or base. Either pulley or motor drive is

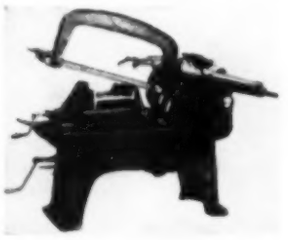


provided. An 8-in. blade is used. Rate of cutting is more than 1 sq.in. per min. Approximate weight, 90 lb.

Sawing Machine, Girder, "Rapidor"

E. G. Herbert, Ltd., Levenshulme, Manchester, England. [Vol.76,p.8E.] E45.

Intended for dealing with standard rolled steel sections, this girder sawing machine has only a single speed, 160 strokes



per min., giving a cutting speed of 160 ft. per min. on the 6 in. stroke. It contains the usual features of Rapidor machines with a feed governor added.

Sawing Machine, Steel-Angle

Greenwood & Batley, Ltd., Leeds, England. [Vol.76.p.20E.]

For cutting angles 2½ by 2½ by ½ in., this section and mitre-cutting machine is driven direct from the lineshaft and controlled by a pedal-operated clutch. Two

sets of blades are required for miter cutting to cut all four ways for each shape of section.

Sawing Machine, Hydraulic

C. Wicksteed & Co., Ltd., Kettering, England. [Vol.76,p. 46E.] 67.

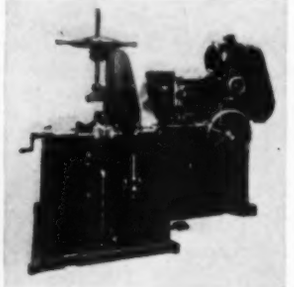
One length and pitch of blade and one speed are claimed appropriate for material of all classes on this machine. The

operator merely sets a pointer on a dial to the size of the bar to be cut. Three sizes are built, the largest to cut up to 8-in. rounds. Stroke is 5½ in.

Sawing Machines, High-Speed

S. Russell & Sons, Ltd., Leicester, England. [Vol.76,p. 92E.] 111.

High-speed cold-sawing machines with either fixed or variable saw-speeds, and saw diameters ranging from 20 to 36 in. are built. Drive from the



main shaft is by a steel worm and phosphor-bronze wormwheel. Five feeds range from ⅛ to 10 in. per min. Gearing for the feed and quick-return motions is totally inclosed. Automatic trip motions are provided.

Sawing Machine

Charles Taylor, Ltd., Birmingham, England. [Vol.76,p. 173E.] 147.

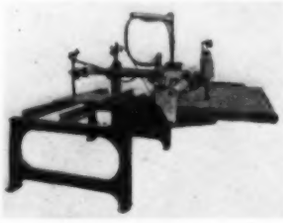
Sawing off non-ferrous extruded metalbars, sections, and tubes is the function of this machine. The new drive is by two pairs of hardened steel and

phosphor-bronze spiral gears which effect the necessary reduction in speed, the main drive being by fast and loose pulleys. The length stop is universally adjustable. Bars up to 1¾ in. can be cut.

Shape Cutting-Machine, Simplex

Hancock & Co., Ltd., Croydon, England. [Vol.76,p.38E.] E62.

Cutting areas of 60 x 40 in. in metal up to 8 in. thick are claimed for this oxygen cutting machine. Unlike the U arm model, it has the workpiece on

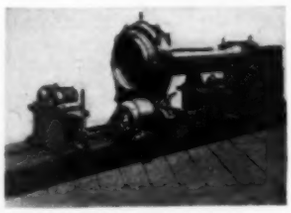


one side of the center and the templet are drawing table on the other. The tracer has a rigid support near the carriage, and the burner can be adjusted to the workpiece independent of the tracer.

Shaper, Internal, Circular, Special

Greenwood & Batley, Ltd., Leeds, England. [Vol.75,p. 190E.] 1.

This machine is for machining out portions of ridges left solid in the centers of long tubes which have been bored out from both ends, the ridge being left to form solid keys. The cutting tool is at the end of the



long overhanging arm, the slide carrying the tool working on surfaces within the arm and being actuated by a link motion driven from the main motor through a gearbox, providing three speed changes. The overhanging arm is 6 ft. long and specified accuracy of the machine is plus or minus 0.001 in. Maximum diameter of tool accommodated is 26 in.

Shaper, Pillar-Type

F. Town & Sons, Halifax, England. [Vol.76,p.48E.] E69.

Three standard sizes of the centralized-control, pillar-type, all-gear, crank-driven shaper are provided: 12 to 14 in., 17 to 19 in. and 24 to 26 in. in stroke. The tool head swivels 180 deg.

Nine ram speeds range from 93 to 8 strokes per min. Worktable is 21 in. long by 14 in. wide by 15½ in. deep. Maximum and minimum distances from the ram to the table top are 18 and 4 in. Cross traverse of the table is 22 in.; vertical traverse, 14 in.

Slotting Machine, Double-Head

Ward, Haggas & Smith, Keighley, England. [Vol.75,p.215E.]

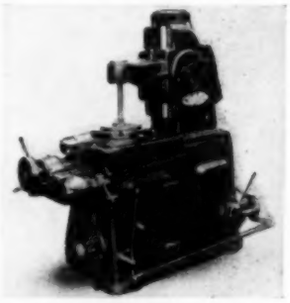
This double-head slotting machine is for machining the ends of power loom stretcher bars. The 12 ft. bed carries two slotting heads and two work tables, 31 by 10 in. wide, adjustable along the bed by hand. Arranged right- and left-hand, the two slotting heads are carried on saddles adjustable longitudinally by hand, through wormwheel and screw. Cross adjustment of 24 in. by hand is

provided to each head. Maximum stroke of the ram is 7 in. and speed is 40 working strokes per min.

Slotting Machine, Spline

Craven Bros. (Manchester), Ltd., Reddish, Stockport, England. [Vol.75,p.286E.] 38.

This spline slotting machine is intended for producing 2-, 4-, 6- and 8-splined holes. It can be used by itself or in conjunction with a broaching machine for preliminary work or to assist in

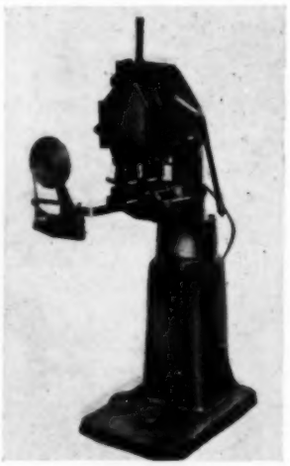


finishing. Maximum stroke is 6 in. and maximum keyway cut is ¾ in. wide. The machine will make 50, 75 and 100 strokes per min., the largest wheel admitted being 12 in. diam.

Soldering Machine, Electric

S. Wolf & Co., Ltd., Southwark St., London, S.E., England. [Vol.76,p.101E.] 116.

L. Schuler, A.G., Germany, developed an electric soldering machine which embodies a patented solder applying device by which ribbon solder is applied

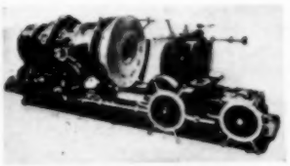


to the seam automatically. At the same time the seam is coated with flux. Power consumption is 800 watts.

Threading Machine, Pipe, 18-In.

Kendall & Gent, Ltd., Belle Vue, Manchester, England. [Vol.76,p.69E.] 91.

The diehead carries tangen-

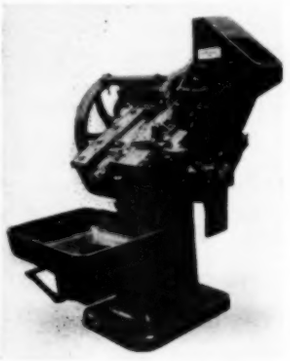


tial chasers in ten steel holders which are opened and closed by cam action. The die ring is graduated and arranged for rapid adjustment to pipe size. Opening and closing of the dies can be effected by hand or by power.

Thread Rolling Machine, Automatic

Greenwood & Batley, Ltd., Leeds, England. [Vol.76,p.58E.] 81.

Maximum diameter of thread produced is ¼ in.; maximum length of blank and length of thread rolled, 2 in. Output is

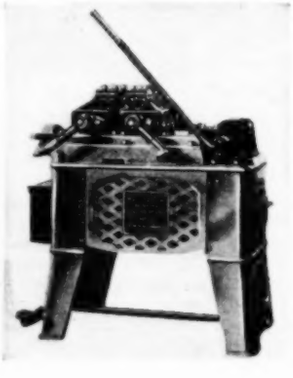


100 to 125 screws per min. The reciprocating slide covering the moving guide is operated by an eccentric, combined with a Whitworth quick-return motion, providing a ratio of 1 to 1.9 rolling to return strokes. Thus, more uniform rolling speed is given than with the direct crank-operated machine.

Welding Machine, Butt

Holden & Hunt, Old Hill, Staffs, England. [Vol.76,p.59E.]

This No. 6 butt welder is of 40-kw. capacity and designed for flash and low-voltage welding 2 sq.in. in mild steel in irregular sections, flat stock, rings and



tubes. Left-hand slide is adjustable to gap of 5 in.; right-hand slide operated by a lever through special cam. Gripping is by hand and of double-acting type.

Welding Machine, Spot, 20-Kw.

British Electric Welding Machines, Ltd., Dudley, England. [Vol.76,p.20E.] 50.

Specially designed for dealing with steel body work for motor cars, this automatic spot welder of duplex-head type is arranged so that the electrodes point in

either vertical or horizontal without dismantling any part of the machine. Reach of the arms is 30 in., dieholder is 1½ in.

Small Tools

Diestock, Adjustable-Chaser

Thomas Chatwin, Ltd., Great Tindal St., Birmingham, England. [Vol.76,p.35E.] 56.

Adjustment of dies is obtained by means of a threaded eccentric coupled to a cam plate by a

spring plunger. The diestock is made in sizes for pipe from ¼ to 4 in. Quick release for the dies is featured.

Drill Ejector

Roberts, Black & Co., Ltd., Bridge St., Manchester, England. [Vol.76,p.173E.] 146.

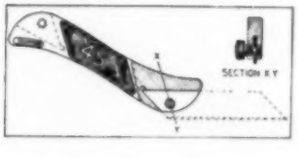
Taper shank drills can be released rapidly by means of this special drill ejector. The blade is of hardened steel and the body

of die-cast aluminum bronze. An external buffer spring takes the shock of the blow.

Hand Tool, Multi-Purpose

James Neill & Co. (Sheffield), Ltd., Sheffield, England. [Vol. 75,p.213E.] 10.

This multi-purpose outfit consists essentially of half a dozen double-edge slotting blades, a



similar number of single-edged sawing blades, two engineers' scrapers, and a belting- and lead-slitting knife, together with a nickel-plated holder-handle by means of which any of the blades may be secured and manipulated.

Hollow Mill, Broached-Relief

B. S. A. Tools, Ltd., Sparkbrook, Birmingham, England. [Vol.76,p.153E.] 138.

Sizes of these hollow mills range from ⅜ in. in diam. by ½ in. long to 1¾ in. in diam. by 2½ in. long, each bored to a num-

ber of standard sizes. A special feature is the broaching of the bore to give relief and accommodation for chips.

Tapping Attachment

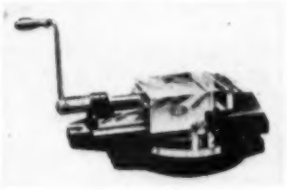
Brooke Tool Mfg. Co., Ltd., Greet, Birmingham, England. [Vol.75,p.239E.] 20.

The tapping attachment has main drive through a friction device. When the required depth is reached an adjustable stop releases the clutch, interrupting rotation of the tap, and permitting reversal at an accelerated rate. It is available in three sizes, ranging from ¼ to ¾ in. Whitworth.

Vises, Swivel- and Flanged-Type

Brooke Tool Mfg. Co., Ltd., Greet, Birmingham, England. [Vol.75,p.264E.] 30.

Illustrated is the swivel-type machine vise with semi-steel base, graduated from zero to 90 deg., right- and left-hand, for setting to any angle. Supplied



in four sizes, the smallest has jaws 4¼ in. wide by 1¼ in. deep to open 2 in., and the largest jaws 7¼ in. wide by 2 in. deep, opening 4½ in.

Vise, Air-Operated

Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.19E.]

Exerting a grip of ¾ ton, this air-operated bench vice works at a standard air pressure of 80 lb. per sq.in. For fragile work it

is equipped with a reducing valve. Jaws are 4½ in. wide by 3½ in. high and open 5½ in.

Vise, Machine, Air-Operated

Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.71E.]

The two sizes have 6- and 8-in. jaws, respectively, jaw openings being 8 and 9¾ in. The

movable rear jaw is located by serrations and a bolt. The air-operated front jaw moves ⅞ in.

Vise Stand, Toolmaker's

Stedall - Dowding Machine Tool Co., St. John St., Clerkenwell, E.C., England. [Vol.76,p. 184E.] 152.

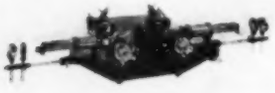
The vise has interchangeable jaws (1¼ in. wide, opening to 1 in.) which are hardened and ground. The vise is mounted on a ball and socket arrangement on a vertical screw which makes the vise adjustable for height. The machined flat under-face of the vise enables it to be used for light machine operations.

Gaging, Inspecting and Testing Equipment

Interferometer for Gage Comparison

Adam Hilger, Ltd., Rochester Place, Camden Road, N.W., England. [Vol.75,p.265E.] 32.

This double-ended interferometer is for comparison of lengths, such as master slip gages. It consists essentially of two Michelson interferometers arranged to observe two ends of



the gage and measure by wave length of light to avoid mechanical contact with the end faces. By means of this unit lengths can be compared to 0.000001 in.

Measuring Instruments, Optical

Alfred Herbert, Ltd., Coventry, England. [Vol.75,p.231E.]

Illustrated are the Koster comparator and loop galvanometer from which temperature readings are obtained of the gage or other object under test. The Koster instrument is used for determining dimensions of slip gages, either by absolute measurement in wave lengths of

light or by comparison with master gages. Dimensions up to 12 in. may be determined, the accuracy of measurement claimed being up to 0.000001 in. With the Zeiss ultra-optimeter, accuracy of a master gage block can be transferred to reference gage blocks.

Steeloscope, Spekker

Adam Hilger, Ltd., Rochester Place, Kentish Town, London, N.W., England. [Vol.75,p.239E.]

See page 867 of the American section for a description of this apparatus.

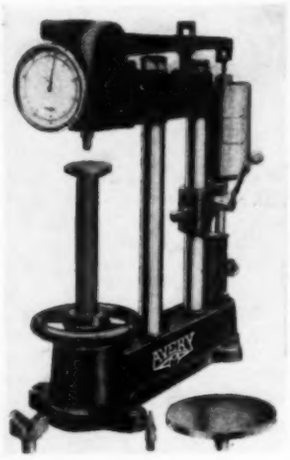
Hardness Tester, Direct-Reading

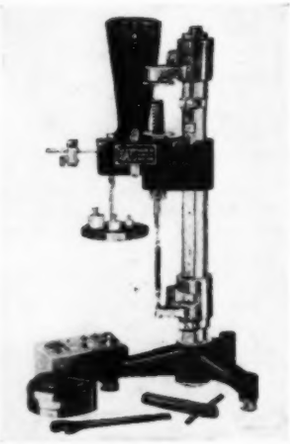
W. & T. Avery, Ltd., Birmingham, England. [Vol.76,p. 37E.] 61.

Elimination of errors due to surface imperfections is claimed for this direct-reading hardness testing machine. Hardness is determined in terms of standard penetration numerals based on the increase in depth of an impression produced by a standard penetrator under a known major load after a first impression has been made by the same penetrator under a known minor load.

Testing Machine, Spring

Coats Machine Tool Co., Ltd., 14 Palmer St., Westminster, S.W., England. [Vol.75,p.251E.]





This small spring tester is intended for inspection of 800 light springs per hour up to a maximum load of 5 lb. Ratio of the weight scale is 1 to 1 and maximum free length of compression springs dealt with is 6½ in., maximum extended length of tension springs being 9 in. Total height of the machine is about 20 in. and net weight 27 lb.

Furnaces and Equipment

Furnace, Electric

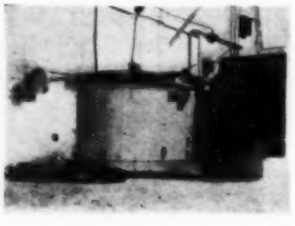
G. W. B. Electric Furnaces, Ltd., North Road, Holloway, N., England. [Vol.75,p.250E.] 23.

One furnace has a chamber 14 ft. long by 7 ft. wide by 5 ft. high to the spring of the arched roof, and a smaller one has a chamber 9 ft. 6 in. long by 4 ft. wide by 3 ft. to the spring of the arch. In the roof of each furnace are two centrifugal fans. Furnace chambers are lined with tunnel bricks, which house thick rod elements in hairpin form.

Furnace, Electric

Wild-Barfield Electric Furnaces, Ltd., Holloway, London, N., England. [Vol.75,p.191E.] 2.

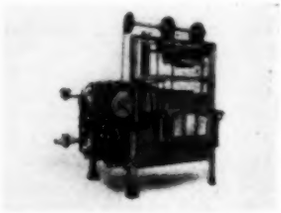
This medium-sized furnace has forced air circulation and a connected load of 28 kw. It is used in combination with a Wild-Barfield-Foster charge progress recorder in tempering steel and heat-treatment of aluminum alloys.



Furnace, Gas-Heated

Brayshaw Furnaces & Tools, Ltd., Hulme, Manchester, England. [Vol.76,p.36E.] 60.

Low gas consumption, rapid heating, easy handling, and accurate control of atmosphere and temperature are claimed for this gas-heated furnace. A gas

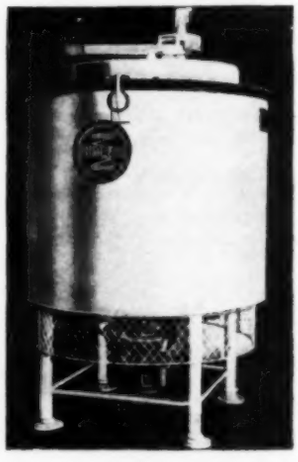


and air proportioning valve provides correct amounts of fuel. Recuperators of special design are embodied.

Furnaces, Tempering

Birmingham Electric Furnaces, Ltd., Birmingham, England. [Vol.76,p.34E.] 55.

Fans are mounted in the bottom of the furnace, are of centrifugal type, and run in a volute casing which, it is

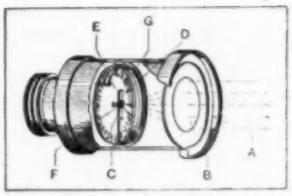


claimed, doubles fan efficiency. Air circulates at 40 m.p.h. Temperatures of two thermo-couples are shown on a recorder.

Pyrometer, Radiation, Pocket

Coats Machine Tool Co., Ltd., Palmer St., Westminster, S.W. England. [Vol.75,p.277E.] 35.

In this Keiser & Schmidt pocket pyrometer ease of reading is provided by an 8-power lens. Temperature is read direct, time lag being 10 sec. to the full reading. Distance from the hot body is about 38 in. with long focal and about 22 in. with short focal instrument.

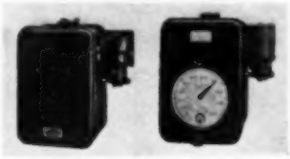


The instrument weighs 6 oz. Temperature ranges are from 600 to 2,400 deg. C.

Temperature Control Apparatus, Automatic

Cambridge Instrument Co., Ltd., Grosvenor Place, London, S.W., England. [Vol.76,p.36E.]

Apparatus for automatic temperature control within 1.5 deg. C. is capable of making or breaking currents up to 10 amp. at 250 volt, and may be used in



conjunction with a thermocouple, resistance thermometer, Fery telescope or other electrical means. It can be calibrated for practically any range up to 1,700 deg. C.

Miscellaneous Equipment

Belt Drive

Crofts (Engineers), Ltd., Thornbury, Bradford, England. [Vol.76,p.142E.] 133.

The "Constension" drive is intended for short-center flat belt, vee-flat, or vee-rope drives, the speed ratios being up to

7 to 1, and capacities up to 50 hp. The motor base is carried on a pivot shaft and the necessary belt tension is determined by the overhang of the motor.

Flexible Coupling, Chain

Morse Chain Co., Ltd., Letchworth, England. [Vol.75,p. 238E.] 18.

Wrapped around the two sprockets is a chain, the two ends of the chain being coupled by means of a pin joint. These couplings are available in 14 sizes, the smallest capable of

transmitting 0.8 hp. at 100 r.p.m. and running at a maximum speed of 4,200 r.p.m., while the largest transmits 158 hp. at 100 r.p.m. and can be run at 730 r.p.m.

Flexible Coupling

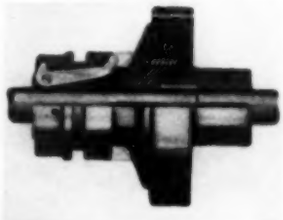
R. Hunt & Co., Ltd., Earls Colne, Essex, England. [Vol. 75,p.264E.] 31.

In this Oldham-type coupling the center member carries on each of its four edges a replaceable bearing strip of nonmetallic material. Standard sizes have flanges bored from $\frac{3}{8}$ to 12 in., and are suitable for maximum misalignments ranging from $\frac{1}{64}$ to $\frac{1}{16}$ in. linear or 1 deg. angular.

Friction Clutch, Disk-Type

Taylor Bros., Castleton, Lancashire, England. [Vol.75,p. 285E.] 36.

This disk clutch is intended for high-speed power transmission. Under-slung levers are used and it is fitted with alternate Ferodo and metal disks.

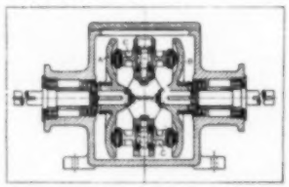


An adjusting collar is provided at the end, and the clutch can be engaged slowly or quickly as desired, and also may be inched.

Speed Reducer, Infinitely Variable

C. O. Ericsson Engineering Co., Ltd., Balsall Heath, Birmingham, England. [Vol.76,p. 186E.] 156.

This "Christiansen" infinitely variable speed reducer employs

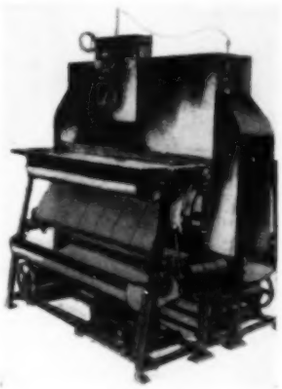


two rotating discs *A* and *B*, driver and driven respectively. Drive from one to the other is transmitted through a third disk or roller *C* that swivel on an axis at right angles to the axis of rotation. By the swiveling action the contact diameters are varied and the relative speeds of the two disks changed up or down.

Blue-Print Machine, Continuous

B. J. Hall & Co., Ltd., Stourton House, Dacre St., London, S.W. England. [Vol.75,p.214E.]

Either a double machine (illustrated) or a single machine of exactly similar design, both constructed on the unit principle, are available. The ma-

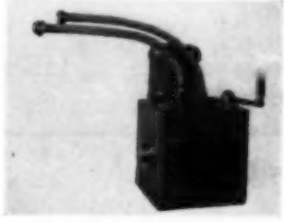


chine consists of two units, namely, the lamp unit and a paper feeding unit. The machine is supplied in three widths, the maximum being 42 in.

Clamping Units, Hydraulic

Gebr. Heller, Nurtingen, Germany. [Vol.76,p.100E.] 115.

A clamping unit, intended for the operation of chucks, tailstock-spindles, and vises on ma-



chine tools, employs a special shifting device in a gear-pump, giving short chucking times because of the quick approach motion, with automatic change from large to small delivery.

Drawing Cloth, Pencil

B. J. Hall & Co., Ltd., Dacre St., London, S.W. England. [Vol.76,p.155E.] 142.

This Mansfield pencil cloth eliminates the necessity of tracing or drawing in order to obtain blueprints. Erasures may be made without damaging the surface. Material is available with single-dull or double-dull surfaces.

Drawing Table, Adjustable

B. J. Hall & Co., Ltd., Stourton House, Dacre St., London, S.W., England. [Vol.75,p. 192E.] 4.

The feature of this adjustable drawing table is that it can be adjusted rapidly from horizontal to vertical position or to any intermediate angle by simply pressing a pedal. Universal

movement of the folding mechanism provides for maximum up and down movement of 24 in. with the board set vertically, while a maximum adjustment of 8 in. is obtainable with the board set horizontally.

Drill and Grinder, Electric

Grimson Electric Tools, Ltd., 324 Gray's Inn Road, London, W.C., England. [Vol.76,p.59E.]

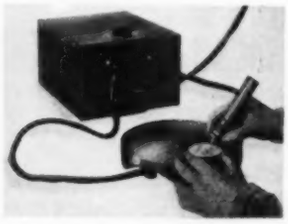
Power can be taken from three spindles, high-speed and low-speed drilling, and a higher-speed direct armature-driven

spindle. The last is for attachment of a flexible shaft driven at 6,500 r.p.m. The high-speed drilling spindle takes drills up to $\frac{3}{8}$ in.; low-speed drilling spindle, $\frac{3}{4}$ in.

Etching Apparatus, Electric

Taylor, Taylor & Hobson, Ltd., Leicester, England. [Vol. 76,p.108E.] 120.

This electric etching apparatus permits marking on soft or tool steel, stainless steel, tungsten carbide, and other metals. The point of the etcher is rendered incandescent, the high temperature thus produced burning the material over which the point moves.



Filter, Oil

AC-Sphinx Sparking Plug Co., Ltd., Birmingham, England. [Vol.76,p.154E.] 140.

This filter is used on precision machine tools. Oil enters an inlet, is forced into tubular passages of cloth bag *B*, filtered through the whole surface of the cloth, and passes through the cylindrical perforated container *C* and thence to a tank before passing to the bearings.

Flexible-Shaft Attachments

F. Gilman (B.S.T.), Ltd., Smethwick, England. [Vol.76, p.34E.] 54.

A filing attachment is interchangeable with the company's other handpieces and working heads, and can be detached from the flexible shaft. The metal-shearing attachment will shear sheet iron of 0.080 in. thick.

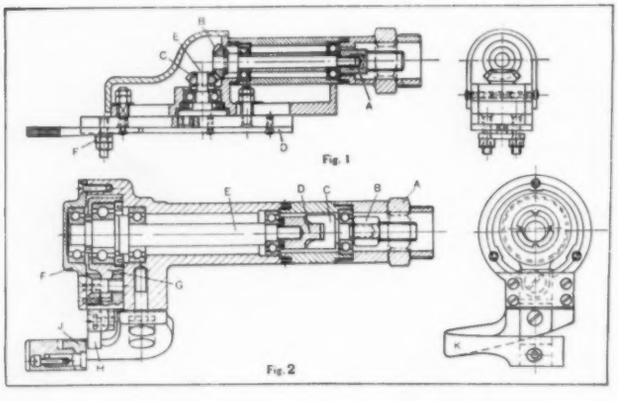
Hoist, Electric

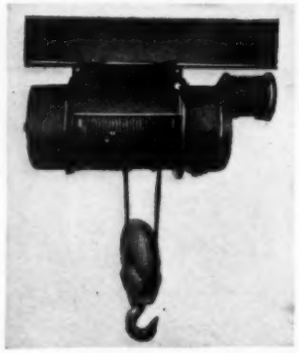
Demag Aktiengesellschaft, Duisburg, Germany. [Vol.75,p. 238E.] 17.

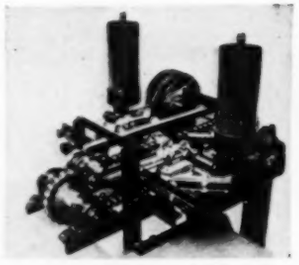
The feature is a small auxiliary motor by which the load can be moved with the controller on its first contact. Hoisting speeds of 10 in. per min. for 5-ton hoists and 30 in. per min. for ¾-ton hoists are obtained. The main motor lifts at 20 to 30 ft. per min.

Lubricator, Conveyor-Chain, Automatic

Tecalemit, Ltd., Great West Road, Brentford, England. [Vol.76,p.38E.] 64.







Automatic lubrication of chain and working parts of conveyors is provided by this lubricator. Ends of the spindles of the buckets come into contact with a part of the lubricator, thus operating the lubricating motion. A complete lubricating mechanism is located at each side of the buckets and both are actuated simultaneously by the spindle ends.

Motors, Repulsion-Induction

Crompton Parkinson, Ltd., Guiseley, England. [Vol.75,p. 213E.] 9.

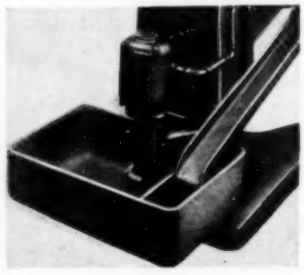
These repulsion-induction motors are intended for industrial service, the ranges being from

1 to 5 hp., 6-pole, and 1½ to 7½ hp., 4-pole, voltage 200 to 250 or 400 to 500, and frequency 40, 50 and 60 cycles, single-phase. An ordinary faceplate starter may be used.

Pump, Centrifugal, Coolant

Alfred Herbert, Ltd., Coventry, England. [Vol.76,p.174E.]

The motor shaft is coupled directly to the impeller shaft which is supported by a ball bearing. By two lugs the pump



can be bolted to a vertical surface. Capacity is 5¼ gal. per min. against a head of 8 ft. 6 in.

Stop-Watch, 30-Hour

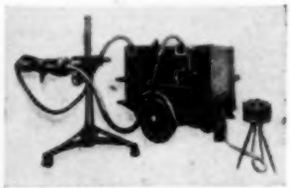
A. Arnold & Co., 122 St. John St., Clerkenwell, E.C., England. [Vol.76,p.154E.] 141.

This 30-hr. stop-watch with lever movement has a dial graduated in hours and minutes and also on the outer ring into 300 divisions, each of which represents ⅕ sec.

X-Ray Apparatus, Industrial

Philips Lamps, Ltd., 145 Charing Cross Road, London, W.C., England. [Vol.76,p.94E.]

This portable X-ray apparatus is used for testing welded joints and consists of an X-ray tube of heavy load capacity, high tension generator with stand and



controls. Construction is shock-proof and gives complete protection from unwanted radiation. The apparatus will penetrate up to 3⅛ in. in steel.